



## **System Management Command Reference, Cisco IOS Release 3SE (Catalyst 3850 Switches)**

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## Preface

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## Document Conventions

This document uses the following conventions:

Convention	Description
^ or Ctrl	Both the ^ symbol and Ctrl represent the Control (Ctrl) key on a keyboard. For example, the key combination <b>^D</b> or <b>Ctrl-D</b> means that you hold down the Control key while you press the D key. (Keys are indicated in capital letters but are not case sensitive.)
<b>bold font</b>	Commands and keywords and user-entered text appear in <b>bold font</b> .
<i>Italic font</i>	Document titles, new or emphasized terms, and arguments for which you supply values are in <i>italic font</i> .
Courier font	Terminal sessions and information the system displays appear in <i>courier font</i> .
<b>Bold Courier font</b>	<b>Bold Courier font</b> indicates text that the user must enter.
[x]	Elements in square brackets are optional.
...	An ellipsis (three consecutive nonbolded periods without spaces) after a syntax element indicates that the element can be repeated.
	A vertical line, called a pipe, indicates a choice within a set of keywords or arguments.
[x   y]	Optional alternative keywords are grouped in brackets and separated by vertical bars.

Convention	Description
{x   y}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x {y   z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
<>	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

### Reader Alert Conventions

This document may use the following conventions for reader alerts:



#### Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



#### Tip

Means *the following information will help you solve a problem*.



#### Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



#### Timesaver

Means *the described action saves time*. You can save time by performing the action described in the paragraph.



#### Warning

Means *reader be warned*. In this situation, you might perform an action that could result in bodily injury.



## Related Documentation

**Note**

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Before installing or upgrading the switch, refer to the switch release notes.

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- Cisco Catalyst 3850 Switch documentation, located at:  
[http://www.cisco.com/go/cat3850\\_docs](http://www.cisco.com/go/cat3850_docs)
- Cisco SFP and SFP+ modules documentation, including compatibility matrixes, located at:  
[http://www.cisco.com/en/US/products/hw/modules/ps5455/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/modules/ps5455/tsd_products_support_series_home.html)
- Cisco Validated Designs documents, located at:  
<http://www.cisco.com/go/designzone>
- Error Message Decoder, located at:  
<https://www.cisco.com/cgi-bin/Support/Errordecoder/index.cgi>

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For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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# Using the Command-Line Interface

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- [How to Use the CLI to Configure Features, page 5](#)

## Information About Using the Command-Line Interface

### Command Modes

The Cisco IOS user interface is divided into many different modes. The commands available to you depend on which mode you are currently in. Enter a question mark (?) at the system prompt to obtain a list of commands available for each command mode.

You can start a CLI session through a console connection, through Telnet, a SSH, or by using the browser.

When you start a session, you begin in user mode, often called user EXEC mode. Only a limited subset of the commands are available in user EXEC mode. For example, most of the user EXEC commands are one-time commands, such as **show** commands, which show the current configuration status, and **clear** commands, which clear counters or interfaces. The user EXEC commands are not saved when the switch reboots.

To have access to all commands, you must enter privileged EXEC mode. Normally, you must enter a password to enter privileged EXEC mode. From this mode, you can enter any privileged EXEC command or enter global configuration mode.

Using the configuration modes (global, interface, and line), you can make changes to the running configuration. If you save the configuration, these commands are stored and used when the switch reboots. To access the various configuration modes, you must start at global configuration mode. From global configuration mode, you can enter interface configuration mode and line configuration mode.

This table describes the main command modes, how to access each one, the prompt you see in that mode, and how to exit the mode.

Table 1: Command Mode Summary

Mode	Access Method	Prompt	Exit Method	About This Mode
User EXEC	Begin a session using Telnet, SSH, or console.	Switch>	Enter <b>logout</b> or <b>quit</b> .	Use this mode to <ul style="list-style-type: none"> <li>• Change terminal settings.</li> <li>• Perform basic tests.</li> <li>• Display system information.</li> </ul>
Privileged EXEC	While in user EXEC mode, enter the <b>enable</b> command.	Switch#	Enter <b>disable</b> to exit.	Use this mode to verify commands that you have entered. Use a password to protect access to this mode.
Global configuration	While in privileged EXEC mode, enter the <b>configure</b> command.	Switch(config)#	To exit to privileged EXEC mode, enter <b>exit</b> or <b>end</b> , or press <b>Ctrl-Z</b> .	Use this mode to configure parameters that apply to the entire switch.
VLAN configuration	While in global configuration mode, enter the <b>vlan</b> <i>vlan-id</i> command.	Switch(config-vlan)#	To exit to global configuration mode, enter the <b>exit</b> command. To return to privileged EXEC mode, press <b>Ctrl-Z</b> or enter <b>end</b> .	Use this mode to configure VLAN parameters. When VTP mode is transparent, you can create extended-range VLANs (VLAN IDs greater than 1005) and save configurations in the switch startup configuration file.
Interface configuration	While in global configuration mode, enter the <b>interface</b> command (with a specific interface).	Switch(config-if)#	To exit to global configuration mode, enter <b>exit</b> . To return to privileged EXEC mode, press <b>Ctrl-Z</b> or enter <b>end</b> .	Use this mode to configure parameters for the Ethernet ports.

Mode	Access Method	Prompt	Exit Method	About This Mode
Line configuration	While in global configuration mode, specify a line with the <b>line vty</b> or <b>line console</b> command.	Switch(config-line)#	To exit to global configuration mode, enter <b>exit</b> .  To return to privileged EXEC mode, press <b>Ctrl-Z</b> or enter <b>end</b> .	Use this mode to configure parameters for the terminal line.

## Using the Help System

You can enter a question mark (?) at the system prompt to display a list of commands available for each command mode. You can also obtain a list of associated keywords and arguments for any command.

### SUMMARY STEPS

1. **help**
2. *abbreviated-command-entry ?*
3. *abbreviated-command-entry <Tab>*
4. **?**
5. *command ?*
6. *command keyword ?*

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>help</b>  <b>Example:</b> Switch# <b>help</b>	Obtains a brief description of the help system in any command mode.
<b>Step 2</b>	<i>abbreviated-command-entry ?</i>  <b>Example:</b> Switch# <b>di?</b> dir disable disconnect	Obtains a list of commands that begin with a particular character string.
<b>Step 3</b>	<i>abbreviated-command-entry &lt;Tab&gt;</i>  <b>Example:</b> Switch# <b>sh conf&lt;tab&gt;</b> Switch# <b>show configuration</b>	Completes a partial command name.

	Command or Action	Purpose
Step 4	?  <b>Example:</b> Switch> ?	Lists all commands available for a particular command mode.
Step 5	<i>command</i> ?  <b>Example:</b> Switch> <b>show</b> ?	Lists the associated keywords for a command.
Step 6	<i>command keyword</i> ?  <b>Example:</b> Switch(config)# <b>cdp holdtime</b> ? <10-255> Length of time (in sec) that receiver must keep this packet	Lists the associated arguments for a keyword.

## Understanding Abbreviated Commands

You need to enter only enough characters for the switch to recognize the command as unique.

This example shows how to enter the **show configuration** privileged EXEC command in an abbreviated form:

```
Switch# show conf
```

## No and Default Forms of Commands

Almost every configuration command also has a **no** form. In general, use the **no** form to disable a feature or function or reverse the action of a command. For example, the **no shutdown** interface configuration command reverses the shutdown of an interface. Use the command without the keyword **no** to reenable a disabled feature or to enable a feature that is disabled by default.

Configuration commands can also have a **default** form. The **default** form of a command returns the command setting to its default. Most commands are disabled by default, so the **default** form is the same as the **no** form. However, some commands are enabled by default and have variables set to certain default values. In these cases, the **default** command enables the command and sets variables to their default values.

## CLI Error Messages

This table lists some error messages that you might encounter while using the CLI to configure your switch.

**Table 2: Common CLI Error Messages**

Error Message	Meaning	How to Get Help
% Ambiguous command: "show con"	You did not enter enough characters for your switch to recognize the command.	Reenter the command followed by a question mark (?) without any space between the command and the question mark.  The possible keywords that you can enter with the command appear.
% Incomplete command.	You did not enter all of the keywords or values required by this command.	Reenter the command followed by a question mark (?) with a space between the command and the question mark.  The possible keywords that you can enter with the command appear.
% Invalid input detected at '^' marker.	You entered the command incorrectly. The caret (^) marks the point of the error.	Enter a question mark (?) to display all of the commands that are available in this command mode.  The possible keywords that you can enter with the command appear.

## Configuration Logging

You can log and view changes to the switch configuration. You can use the Configuration Change Logging and Notification feature to track changes on a per-session and per-user basis. The logger tracks each configuration command that is applied, the user who entered the command, the time that the command was entered, and the parser return code for the command. This feature includes a mechanism for asynchronous notification to registered applications whenever the configuration changes. You can choose to have the notifications sent to the syslog.




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**Note** Only CLI or HTTP changes are logged.

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## How to Use the CLI to Configure Features

### Configuring the Command History

The software provides a history or record of commands that you have entered. The command history feature is particularly useful for recalling long or complex commands or entries, including access lists. You can customize this feature to suit your needs.

## Changing the Command History Buffer Size

By default, the switch records ten command lines in its history buffer. You can alter this number for a current terminal session or for all sessions on a particular line. This procedure is optional.

### SUMMARY STEPS

1. **terminal history** [*size number-of-lines*]

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>terminal history</b> [ <i>size number-of-lines</i> ]  <b>Example:</b> Switch# <b>terminal history size 200</b>	Changes the number of command lines that the switch records during the current terminal session in privileged EXEC mode. You can configure the size from 0 to 256.

## Recalling Commands

To recall commands from the history buffer, perform one of the actions listed in this table. These actions are optional.



### Note

The arrow keys function only on ANSI-compatible terminals such as VT100s.

### SUMMARY STEPS

1. **Ctrl-P** or use the **up arrow** key
2. **Ctrl-N** or use the **down arrow** key
3. **show history**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>Ctrl-P</b> or use the <b>up arrow</b> key	Recalls commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
<b>Step 2</b>	<b>Ctrl-N</b> or use the <b>down arrow</b> key	Returns to more recent commands in the history buffer after recalling commands with <b>Ctrl-P</b> or the up arrow key. Repeat the key sequence to recall successively more recent commands.



	Command or Action	Purpose
<b>Step 3</b>	<b>show history</b>  <b>Example:</b> Switch# <code>show history</code>	Lists the last several commands that you just entered in privileged EXEC mode. The number of commands that appear is controlled by the setting of the <b>terminal history</b> global configuration command and the <b>history</b> line configuration command.

## Disabling the Command History Feature

The command history feature is automatically enabled. You can disable it for the current terminal session or for the command line. This procedure is optional.

### SUMMARY STEPS

1. `terminal no history`

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>terminal no history</b>  <b>Example:</b> Switch# <code>terminal no history</code>	Disables the feature during the current terminal session in privileged EXEC mode.

## Enabling and Disabling Editing Features

Although enhanced editing mode is automatically enabled, you can disable it and reenble it.

### SUMMARY STEPS

1. `terminal editing`
2. `terminal no editing`

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>terminal editing</b>  <b>Example:</b> Switch# <code>terminal editing</code>	Reenables the enhanced editing mode for the current terminal session in privileged EXEC mode.

	Command or Action	Purpose
<b>Step 2</b>	<b>terminal no editing</b>  <b>Example:</b> Switch# <code>terminal no editing</code>	Disables the enhanced editing mode for the current terminal session in privileged EXEC mode.

## Editing Commands Through Keystrokes

The keystrokes help you to edit the command lines. These keystrokes are optional.


**Note**

The arrow keys function only on ANSI-compatible terminals such as VT100s.

**Table 3: Editing Commands**

Editing Commands	Description
<b>Ctrl-B</b> or use the <b>left arrow</b> key	Moves the cursor back one character.
<b>Ctrl-F</b> or use the <b>right arrow</b> key	Moves the cursor forward one character.
<b>Ctrl-A</b>	Moves the cursor to the beginning of the command line.
<b>Ctrl-E</b>	Moves the cursor to the end of the command line.
<b>Esc B</b>	Moves the cursor back one word.
<b>Esc F</b>	Moves the cursor forward one word.
<b>Ctrl-T</b>	Transposes the character to the left of the cursor with the character located at the cursor.
<b>Delete</b> or <b>Backspace</b> key	Erases the character to the left of the cursor.
<b>Ctrl-D</b>	Deletes the character at the cursor.
<b>Ctrl-K</b>	Deletes all characters from the cursor to the end of the command line.
<b>Ctrl-U</b> or <b>Ctrl-X</b>	Deletes all characters from the cursor to the beginning of the command line.
<b>Ctrl-W</b>	Deletes the word to the left of the cursor.
<b>Esc D</b>	Deletes from the cursor to the end of the word.
<b>Esc C</b>	Capitalizes at the cursor.
<b>Esc L</b>	Changes the word at the cursor to lowercase.
<b>Esc U</b>	Capitalizes letters from the cursor to the end of the word.

<b>Ctrl-V</b> or <b>Esc Q</b>	Designates a particular keystroke as an executable command, perhaps as a shortcut.
<b>Return</b> key	Scrolls down a line or screen on displays that are longer than the terminal screen can display.  <b>Note</b> The More prompt is used for any output that has more lines than can be displayed on the terminal screen, including <b>show</b> command output. You can use the <b>Return</b> and <b>Space</b> bar keystrokes whenever you see the More prompt.
<b>Space</b> bar	Scrolls down one screen.
<b>Ctrl-L</b> or <b>Ctrl-R</b>	Redisplays the current command line if the switch suddenly sends a message to your screen.

## Editing Command Lines That Wrap

You can use a wraparound feature for commands that extend beyond a single line on the screen. When the cursor reaches the right margin, the command line shifts ten spaces to the left. You cannot see the first ten characters of the line, but you can scroll back and check the syntax at the beginning of the command. The keystroke actions are optional.

To scroll back to the beginning of the command entry, press **Ctrl-B** or the left arrow key repeatedly. You can also press **Ctrl-A** to immediately move to the beginning of the line.



### Note

The arrow keys function only on ANSI-compatible terminals such as VT100s.

The following example shows how to wrap a command line that extends beyond a single line on the screen.

## SUMMARY STEPS

1. **access-list**
2. **Ctrl-A**
3. **Return** key

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>access-list</b>  <b>Example:</b> Switch(config)# <b>access-list 101 permit tcp</b>	Displays the global configuration command entry that extends beyond one line.  When the cursor first reaches the end of the line, the line is shifted ten spaces to the left and redisplayed. The dollar sign (\$) shows that the

	Command or Action	Purpose
	<pre>10.15.22.25 255.255.255.0 10.15.22.35 Switch(config)# \$ 101 permit tcp 10.15.22.25 255.255.255.0 10.15.22.35 255.25 Switch(config)# \$t tcp 10.15.22.25 255.255.255.0 131.108.1.20 255.255.255.0 eq Switch(config)# \$15.22.25 255.255.255.0 10.15.22.35 255.255.255.0 eq 45</pre>	line has been scrolled to the left. Each time the cursor reaches the end of the line, the line is again shifted ten spaces to the left.
<b>Step 2</b>	<p><b>Ctrl-A</b></p> <p><b>Example:</b></p> <pre>Switch(config)# access-list 101 permit tcp 10.15.22.25 255.255.255.0 10.15.25\$</pre>	<p>Checks the complete syntax.</p> <p>The dollar sign (\$) appears at the end of the line to show that the line has been scrolled to the right.</p>
<b>Step 3</b>	<b>Return key</b>	<p>Execute the commands.</p> <p>The software assumes that you have a terminal screen that is 80 columns wide. If you have a different width, use the <b>terminal width</b> privileged EXEC command to set the width of your terminal.</p> <p>Use line wrapping with the command history feature to recall and modify previous complex command entries.</p>

## Searching and Filtering Output of show and more Commands

You can search and filter the output for **show** and **more** commands. This is useful when you need to sort through large amounts of output or if you want to exclude output that you do not need to see. Using these commands is optional.

### SUMMARY STEPS

1. `{show | more} command | {begin | include | exclude} regular-expression`

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<pre>{show   more} command   {begin   include   exclude} regular-expression</pre> <p><b>Example:</b></p> <pre>Switch# show interfaces   include protocol Vlan1 is up, line protocol is up Vlan10 is up, line protocol is down GigabitEthernet1/0/1 is up, line protocol is down GigabitEthernet1/0/2 is up, line protocol is up</pre>	<p>Searches and filters the output.</p> <p>Expressions are case sensitive. For example, if you enter <b>  exclude output</b>, the lines that contain <b>output</b> are not displayed, but the lines that contain <b>OUTPUT</b> appear.</p>

## Accessing the CLI on a Switch Stack

You can access the CLI through a console connection, through Telnet, a SSH, or by using the browser.

You manage the switch stack and the stack member interfaces through the active switch. You cannot manage stack members on an individual switch basis. You can connect to the active switch through the console port or the Ethernet management port of one or more stack members. Be careful with using multiple CLI sessions on the active switch. Commands that you enter in one session are not displayed in the other sessions. Therefore, it is possible to lose track of the session from which you entered commands.

**Note**

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We recommend using one CLI session when managing the switch stack.

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If you want to configure a specific stack member port, you must include the stack member number in the CLI command interface notation.

To debug the standby switch, use the **session standby ios** privileged EXEC command from the active switch to access the IOS console of the standby switch. To debug a specific stack member, use the **session switch stack-member-number** privileged EXEC command from the active switch to access the diagnostic shell of the stack member. For more information about these commands, see the switch command reference.

## Accessing the CLI Through a Console Connection or Through Telnet

Before you can access the CLI, you must connect a terminal or a PC to the switch console or connect a PC to the Ethernet management port and then power on the switch, as described in the hardware installation guide that shipped with your switch.

If your switch is already configured, you can access the CLI through a local console connection or through a remote Telnet session, but your switch must first be configured for this type of access.

You can use one of these methods to establish a connection with the switch:

- Connect the switch console port to a management station or dial-up modem, or connect the Ethernet management port to a PC. For information about connecting to the console or Ethernet management port, see the switch hardware installation guide.
- Use any Telnet TCP/IP or encrypted Secure Shell (SSH) package from a remote management station. The switch must have network connectivity with the Telnet or SSH client, and the switch must have an enable secret password configured.
  - The switch supports up to 16 simultaneous Telnet sessions. Changes made by one Telnet user are reflected in all other Telnet sessions.
  - The switch supports up to five simultaneous secure SSH sessions.

After you connect through the console port, through the Ethernet management port, through a Telnet session or through an SSH session, the user EXEC prompt appears on the management station.



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# arp

To display the contents of the Address Resolution Protocol (ARP) table, use the **arp** command in boot loader mode.

```
arp [ ip_address ]
```

## Syntax Description

<i>ip_address</i>	(Optional) Shows the ARP table or the mapping for a specific IP address.
-------------------	--

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

The ARP table contains the IP-address-to-MAC-address mappings.

## Examples

This example shows how to display the ARP table:

```
Switch: arp 172.20.136.8
arp'ing 172.20.136.8...
172.20.136.8 is at 00:1b:78:d1:25:ae, via port 0
```

## Related Commands

Command	Description
<a href="#">set</a>	Sets or displays environment variables.

# boot

To load and boot an executable image and display the command-line interface (CLI), use the **boot** command in boot loader mode.

```
boot [-post | -n | -p |flag] filesystem:/file-url...
```

## Syntax Description

<b>-post</b>	(Optional) Run the loaded image with an extended or comprehensive power-on self-test (POST). Using this keyword causes POST to take longer to complete.
<b>-n</b>	(Optional) Pause for the Cisco IOS Debugger immediately after launching.
<b>-p</b>	(Optional) Pause for the JTAG Debugger right after loading the image.
<i>filesystem:</i>	Alias for a file system. Use <b>flash:</b> for the system board flash device; use <b>usbflash0:</b> for USB memory sticks.
<i>/file-url</i>	Path (directory) and name of a bootable image. Separate image names with a semicolon.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

When you enter the **boot** command without any arguments, the switch attempts to automatically boot the system by using the information in the BOOT environment variable, if any.

If you supply an image name for the *file-url* variable, the **boot** command attempts to boot the specified image.

When you specify boot loader **boot** command options, they are executed immediately and apply only to the current boot loader session.

These settings are not saved for the next boot operation.

Filenames and directory names are case sensitive.

## Examples

This example shows how to boot the switch using the *new-image.bin* image:

```
Switch: set BOOT flash:/new-images/new-image.bin
Switch: boot
```

After entering this command, you are prompted to start the setup program.

# cat

To display the contents of one or more files, use the **cat** command in boot loader mode.

**cat** *filesystem:/file-url...*

## Syntax Description

<i>filesystem:</i>	Specifies a file system.
<i>/file-url</i>	Specifies the path (directory) and name of the files to display. Separate each filename with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Filenames and directory names are case sensitive.

If you specify a list of files, the contents of each file appears sequentially.

## Examples

This example shows how to display the contents of an image file:

```
Switch: cat flash:image_file_name
version_suffix: universal-122-xx.SEx
version_directory: image_file_name
image_system_type_id: 0x00000002
image_name: image_file_name.bin
ios_image_file_size: 8919552
total_image_file_size: 11592192
image_feature: IP|LAYER_3|PLUS|MIN_DRAM_MEG=128
image_family: family
stacking_number: 1.34
board_ids: 0x00000068 0x00000069 0x0000006a 0x0000006b
info_end:
```

# clear location

To clear a specific radio frequency identification (RFID) tag or all of the RFID tags information in the entire database, use the **clear location** command in EXEC mode.

**clear location** [**mac-address** *mac-address* | **rfid**]

## Syntax Description

<b>mac-address</b> <i>mac-address</i>	MAC address of a specific RFID tag.
<b>rfid</b>	Specifies all of the RFID tags in the database.

## Command Default

No default behavior or values.

## Command Modes

User EXEC  
Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to clear information about all of the RFID tags in the database:

```
Switch> clear location rfid
```

# clear location statistics

To clear radio-frequency identification (RFID) statistics, use the **clear location statistics** command in EXEC mode.

**clear location statistics**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** User EXEC  
Privileged EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **clear location rfid** command and shows how to clear RFID statistics:  
Switch> **clear location statistics**

## clear nmsp statistics

To clear the Network Mobility Services Protocol (NMSP) statistics, use the **clear nmsp statistics** command in EXEC mode.

**clear nmsp statistics**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** User Exec  
Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **clear nmsp statistics** command and shows how to clear all statistics about NMSP information exchanged between the controller and the connected Cisco Mobility Services Engine (MSE):

```
Switch> clear nmsp statistics
```



# clear wireless ccx statistics

To clear CCX statistics, use the **clear wireless ccx statistics** command in EXEC mode.

**clear wireless ccx statistics**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** User EXEC  
Privileged EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **clear wireless ccx statistics** command and shows how to clear all collected statistics about CCX clients:

```
Switch> clear wireless ccx statistics
```

## clear wireless client tsm dot11

To clear the traffic stream metrics (TSM) statistics for a particular access point or all of the access points to which this client is associated, use the **clear wireless client tsm dot11** command in EXEC mode.

```
clear wireless client tsm dot11 {24ghz| 5ghz} client-mac-addr {all| name ap-name}
```

Syntax Description		
<b>24ghz</b>		Specifies the 802.11a network.
<b>5ghz</b>		Specifies the 802.11b network.
<i>client-mac-addr</i>		MAC address of the client.
<b>all</b>		Specifies all access points.
<b>name ap-name</b>		Name of a Cisco lightweight access point.

**Command Default** No default behavior or values.

**Command Modes** User EXEC  
Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **clear wireless client tsm dot11** command and shows how to clear the TSM for the MAC address 00:40:96:a8:f7:98 on all of the access points 5-GHz radios where this client is known:

```
Switch> clear wireless client tsm dot11 5ghz 00:40:96:a8:f7:98 all
```

# clear wireless location s69 statistics

To clear statistics about S69 exchanges with CCXv5 clients, use the **clear wireless location s69 statistics** command in EXEC mode.

**clear wireless location s69 statistics**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** User EXEC  
Privileged EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines** S69 messages are exchanged between CCXv5 clients and the wireless infrastructure. The CCXv5 client uses S69 message to request location information, that is then returned by the wireless infrastructure through a S69 response message.

**Examples** The following is sample output from the **clear wireless location s69 statistics** command and shows how to clear statistics about S69 exchanges with CCXv5 clients:

```
Switch> clear wireless location s69 statistics
```

# copy

To copy a file from a source to a destination, use the **copy** command in boot loader mode.

**copy** *filesystem:/source-file-url filesystem:/destination-file-url*

## Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks.
<i>/source-file-url</i>	Path (directory) and filename (source) to be copied.
<i>/destination-file-url</i>	Path (directory) and filename of the destination.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Filenames and directory names are case sensitive.

Directory names are limited to 127 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

Filenames are limited to 127 characters; the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

If you are copying a file to a new directory, the directory must already exist.

## Examples

This example shows how to copy a file at the root:

```
Switch: copy usbflash0:test1.text usbflash0:test4.text
File "usbflash0:test1.text" successfully copied to "usbflash0:test4.text"
```

You can verify that the file was copied by entering the **dir filesystem:** boot loader command.

## debug call-admission wireless all

To enable debugging of the wireless Call Admission Control (CAC) feature, use the **debug call-admission wireless all** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

**debug call-admission wireless all** [*switch switch*]

**no debug call-admission wireless all** [*switch switch*]

### Syntax Description

<b>switch</b>	Configures debugging options for all wireless CAC messages associated to a particular switch.
---------------	---

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Examples

The following is sample output from the **debug call-admission wireless switch** command and shows how to enable debugging options for CAC messages:

```
Switch# debug call-admission wireless switch 1 all
```

## debug rfid

To configure radio-frequency identification (RFID) debug options, use the **debug rfid** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

```
debug rfid {debug_leaf_name | all | detail | error | nmsp | receive} [filter | switch switch]
```

```
no debug rfid {debug_leaf_name | all | detail | error | nmsp | receive} [filter | switch switch]
```

### Syntax Description

<i>debug_leaf_name</i>	Debug leaf name.
<b>all</b>	Configures debugging of all RFID.
<b>detail</b>	Configures debugging of RFID detail.
<b>error</b>	Configures debugging of RFID error messages.
<b>nmsp</b>	Configures debugging of RFID Network Mobility Services Protocol (NMSP) messages.
<b>receive</b>	Configures debugging of incoming RFID tag messages.
<i>filter</i>	Debug flag filter name.
<b>switch</b> <i>switch</i>	Configures RFID debugging for switch.

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Examples

The following is sample output from the **debug rfid** command and shows how to enable debugging of RFID error messages:

```
Switch# debug rfid error switch 1
```

# debug voice diagnostics mac-address

To enable debugging of voice diagnostics for voice clients, use the **debug voice diagnostics mac-address** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

**debug voice diagnostics mac-address** *mac-address1* **verbose** **mac-address** *mac-address2* **verbose**  
**nodebug voice diagnostics mac-address** *mac-address1* **verbose** **mac-address** *mac-address2* **verbose**

## Syntax Description

<b>voice diagnostics</b>	Configures voice debugging for voice clients.
<b>mac-address</b> <i>mac-address1</i> <b>mac-address</b> <i>mac-address2</i>	Specifies MAC addresses of the voice clients.
<b>verbose</b>	Enables verbose mode for voice diagnostics.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **debug voice diagnostics mac-address** command and shows how to enable debugging of voice diagnostics for voice client with MAC address of 00:1f:ca:cf:b6:60:

```
Switch# debug voice diagnostics mac-address 00:1f:ca:cf:b6:60
```

## debug wps mfp

To enable WPS MFP debugging options, use the **debug wps mfp** command in privileged EXEC mode. To disable debugging, use the no form of this command.

```
debug wps mfp {all | capwap| client | detail| mm| report}[switch switch]
```

### Syntax Description

<b>wps mfp</b>	Configures WPS MFP debugging options.
<b>all</b>	Displays all WPS MFP debugging messages.
<b>capwap</b>	Displays MFP messages.
<b>client</b>	Displays client MFP messages.
<b>detail</b>	Displays detailed MFP CAPWAP messages.
<b>mm</b>	Displays MFP mobility (inter-controller) messages.
<b>report</b>	Displays MFP reports.
<b>switch <i>switch</i></b>	Displays the WPS MFP debugging for the switch.

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Examples

This example shows how to enable WPS MFP debugging options for client:

```
Switch# debug wps mfp client switch 1
```



# delete

To delete one or more files from the specified file system, use the **delete** command in boot loader mode.

**delete** *filesystem:/file-url...*

## Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks.
<i>/file-url...</i>	Path (directory) and filename to delete. Separate each filename with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Filenames and directory names are case sensitive.

The switch prompts you for confirmation before deleting each file.

## Examples

This example shows how to delete two files:

```
Switch: delete usbflash0:test2.text usbflash0:test5.text
Are you sure you want to delete "usbflash0:test2.text" (y/n)?y
File "usbflash0:test2.text" deleted
Are you sure you want to delete "usbflash0:test5.text" (y/n)?y
File "usbflash0:test2.text" deleted
```

You can verify that the files were deleted by entering the **dir usbflash0:** boot loader command.

# dir

To display the list of files and directories on the specified file system, use the **dir** command in boot loader mode.

**dir** *filesystem:/file-url*

## Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>flash:</b> for the system board flash device; use <b>usbflash0:</b> for USB memory sticks.
<i>/file-url</i>	(Optional) Path (directory) and directory name that contain the contents you want to display. Separate each directory name with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot Loader  
Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Directory names are case sensitive.

## Examples

This example shows how to display the files in flash memory:

```
Switch: dir flash:
Directory of flash:/
  2  -rwx      561   Mar 01 2013 00:48:15  express_setup.debug
  3  -rwx    2160256   Mar 01 2013 04:18:48  c2960x-dmon-mz-150-2r.EX
  4  -rwx     1048   Mar 01 2013 00:01:39  multiple-fs
  6  drwx      512   Mar 01 2013 23:11:42  c2960x-universalk9-mz.150-2.EX
645 drwx      512   Mar 01 2013 00:01:11  dc_profile_dir
647 -rwx     4316   Mar 01 2013 01:14:05  config.text
648 -rwx        5   Mar 01 2013 00:01:39  private-config.text

96453632 bytes available (25732096 bytes used)
```

**Table 4: dir Field Descriptions**

Field	Description
2	Index number of the file.

Field	Description
-rwx	File permission, which can be any or all of the following: <ul style="list-style-type: none"> <li>• d—directory</li> <li>• r—readable</li> <li>• w—writable</li> <li>• x—executable</li> </ul>
1644045	Size of the file.
<date>	Last modification date.
env_vars	Filename.

**Related Commands**

Command	Description
<a href="#">mkdir</a>	Creates one or more directories on the specified file system.
<a href="#">rmdir</a>	Removes one or more empty directories from the specified file system.

# emergency-install

To perform an emergency installation on your system, use the **emergency-install** command in boot loader mode.

**emergency-install** *url://<url>*

## Syntax Description

<i>&lt;url&gt;</i>	URL and name of the file containing the emergency installation bundle image.
--------------------	--

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

The boot flash is erased during the installation operation.

## Examples

This example shows how to perform the emergency install operation using the contents of an image file:

```
Switch: emergency-install tftp:<url>
The bootflash will be erased during install operation, continue (y/n)?y
Starting emergency recovery (tftp:<url> ...
Reading full image into memory.....done
Nova Bundle Image
-----
Kernel Address      : 0x6042d5c8
Kernel Size         : 0x317ccc/3243212
Initramfs Address   : 0x60745294
Initramfs Size      : 0xdc6774/14444404
Compression Format   : .mzip

Bootable image at @ ram:0x6042d5c8
Bootable image segment 0 address range [0x81100000, 0x81b80000] is in range \
[0x80180000, 0x90000000].
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
File "sda9:c3850-recovery.bin" uncompressed and installed, entry point: 0x811060f0
Loading Linux kernel with entry point 0x811060f0 ...
Bootloader: Done loading app on core_mask: 0xf

### Launching Linux Kernel (flags = 0x5)

Initiating Emergency Installation of bundle \
tftp:<url>
```

```
Downloading bundle tftp:<url>...
Validating bundle tftp:<url>...
Installing bundle tftp:<url>...
Verifying bundle tftp:<url>...
Package cat3k_caa-base.SPA.03.02.00SE.pkg is Digitally Signed
Package cat3k_caa-drivers.SPA.03.02.00.SE.pkg is Digitally Signed
Package cat3k_caa-infra.SPA.03.02.00SE.pkg is Digitally Signed
Package cat3k_caa-iosd-universalk9.SPA.150-1.EX.pkg is Digitally Signed
Package cat3k_caa-platform.SPA.03.02.00.SE.pkg is Digitally Signed
Package cat3k_caa-wcm.SPA.10.0.100.0.pkg is Digitally Signed
Preparing flash...
Syncing device...
Emergency Install successful... Rebooting
Restarting system.\ufffd

Booting...(use DDR clock 667 MHz)Initializing and Testing RAM
+++@@@#####...+@+@+@+@+@+@+@+@+@+@+@+@+@+@+@+@+@+@+@done.
Memory Test Pass!

Base ethernet MAC Address: 20:37:06:ce:25:80
Initializing Flash...

flashfs[7]: 0 files, 1 directories
flashfs[7]: 0 orphaned files, 0 orphaned directories
flashfs[7]: Total bytes: 6784000
flashfs[7]: Bytes used: 1024
flashfs[7]: Bytes available: 6782976
flashfs[7]: flashfs fsck took 1 seconds....done Initializing Flash.

The system is not configured to boot automatically. The
following command will finish loading the operating system
software:

    boot
```

# exit

To return to the previous mode or exit from the CLI EXEC mode, use the **exit** command.

**exit**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC  
Global configuration

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** This example shows how to exit the configuration mode:

```
Switch(config)# exit
Switch#
```

# flash\_init

To initialize the flash: file system, use the **flash\_init** command in boot loader mode.

**flash\_init**

**Syntax Description** This command has no arguments or keywords.

**Command Default** The flash: file system is automatically initialized during normal system operation.

**Command Modes** Boot loader

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines** During the normal boot process, the flash: file system is automatically initialized. Use this command to manually initialize the flash: file system. For example, you use this command during the recovery procedure for a lost or forgotten password.

# help

To display the available commands, use the **help** command in boot loader mode.

## help

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Boot loader

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** This example shows how to display a list of available boot loader commands:

```
Switch:help
? -- Present list of available commands
arp -- Show arp table or arp-resolve an address
boot -- Load and boot an executable image
cat -- Concatenate (type) file(s)
copy -- Copy a file
delete -- Delete file(s)
dir -- List files in directories
emergency-install -- Initiate Disaster Recovery
...
...
...
unset -- Unset one or more environment variables
version -- Display boot loader version
```



# license right-to-use

To configure right-to-use access point adder licenses on the switch, use the **license right-to-use** command in privileged EXEC mode.

**license right-to-use** {**activate** | **deactivate**} **apcount** | **ipbase** | **ipservices** | **lanbase**

Syntax Description		
	<b>activate</b>	Activates permanent or evaluation ap-count licenses.
	<b>deactivate</b>	Deactivates permanent or evaluation ap-count licenses.
	<b>apcount</b> <i>count</i>	Specifies the number of ap-count licenses added.  You can configure the number of adder licenses from 5 to 50.
	<b>ipbase</b> <i>count</i>	Activates ipbase licenses on the switch.
	<b>ipservices</b> <i>count</i>	Activates ipservices licenses on the switch.
	<b>lanbase</b> <i>count</i>	Activates lanbase licenses on the switch.

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** This example shows how to activate an ap-count evaluation license:

```
Switch# license right-to-use activate apcount evaluation
Switch# end
```

This example shows how to activate an ap-count permanent license:

```
Switch# license right-to-use deactivate apcount evaluation
Switch# end
```

This example shows how to add a new ap-count license:

```
Switch# license right-to-use activate apcount 500 slot 1
Switch# end
```

# location

To configure location information for an endpoint, use the **location** command in global configuration mode. To remove the location information, use the **no** form of this command.

```
location {admin-tag string| algorithm| civic-location identifier {host| id}| civic-location identifier {host| id}| elin-location {string| identifier id}|
expiry {calibrating-client timeout-value| client timeout-value| rogue-aps timeout-value| tags timeout-value}|
geo-location identifier {host| id}| notify-threshold {client db| rogue-aps db| tags db}| plm {calibrating|
{multiband | uniband}| client burst-interval}| prefer {cdp weight priority-value| lldp-med
weight priority-value| static config weight priority-value}| rfid {status
| timeout rfid-timeout-value| vendor-name name}| rssi-half-life {
calibrating-client seconds| client seconds| rogue-aps seconds| tags seconds}

no location {admin-tag string| algorithm| civic-location identifier {host| id}| civic-location identifier
{host| id}| elin-location {string| identifier id}|
expiry {calibrating-client timeout-value| client timeout-value| rogue-aps timeout-value| tags timeout-value}|
geo-location identifier {host| id}| notify-threshold {client db| rogue-aps db| tags db}| plm {calibrating|
{multiband | uniband}| client burst-interval}| prefer {cdp weight priority-value| lldp-med
weight priority-value| static config weight priority-value}| rfid {status
| timeout rfid-timeout-value| vendor-name name}| rssi-half-life {
calibrating-client seconds| client seconds| rogue-aps seconds| tags seconds}
```

## Syntax Description

<b>admin-tag</b> <i>string</i>	Configures administrative tag or site information. Site or location information in alphanumeric format.
<b>algorithm</b>	Configures the algorithm used to average RSSI and SNR values.
<b>civic-location</b>	Configures civic location information.
<b>identifier</b>	Specifies the name of the civic location, emergency, or geographical location.
<b>host</b>	Defines the host civic or geo-spatial location.
<i>id</i>	Name of the civic, emergency, or geographical location.  <b>Note</b> The identifier for the civic location in the LLDP-MED switch TLV is limited to 250 bytes or less. To avoid error messages about available buffer space during switch configuration, be sure that the total length of all civic-location information specified for each civic-location identifier does not exceed 250 bytes.
<b>elin-location</b>	Configures emergency location information (ELIN).

<b>expiry</b> { <b>calibrating-client</b>   <b>client</b>   <b>rogue-aps</b>   <b>tags</b> } <i>timeout-value</i>	Configures the timeout for RSSI values for calibrating clients, clients, rogue access points, and RFID tags.  The valid range for the timeout parameter for calibrating clients is 1 to 3600 seconds, and the default value is 5 seconds.  The valid range for the timeout parameter for clients, rogue access points, and RFID tags is 5 to 3600 seconds, and the default value is 5 seconds
<b>geo-location</b>	Configures geo-spatial location information.
<b>notify-threshold</b> { <b>client</b>   <b>rogue-aps</b>   <b>tags</b> } <i>db</i>	Configures the NMSP notification threshold for RSSI measurements.  The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.
<b>calibrating</b> { <b>multiband</b>   <b>uniband</b> }   <b>client</b> <i>seconds</i>	Configures path loss measurement (CCX S60) request for calibrating clients and burst interval for clients.  The valid range for the burst interval parameter is 0 to 3600 seconds.
<b>prefer</b>	Sets location information source priority.
<b>rfid</b>	Configures RFID tag tracking for a location.
<b>rssi-half-life</b>	Configures the RSSI half life for various devices.

**Command Default** No default behavior or values.

**Command Modes** Global configuration

#### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

#### Usage Guidelines

After entering the **location civic-location identifier** global configuration command, you enter civic location configuration mode. After entering the **location geo-location identifier** global configuration command, you enter geo location configuration mode.

The civic-location identifier must not exceed 250 bytes.

The host identifier configures the host civic or geo-spatial location. If the identifier is not a host, the identifier only defines a civic location or geo-spatial template that can be referenced on the interface.

The **host** keyword defines the device location. The civic location options available for configuration using the **identifier** and the **host** keyword are the same. You can specify the following civic location options in civic location configuration mode:

- **additional-code**—Sets an additional civic location code.
- **additional-location-information**—Sets additional civic location information.
- **branch-road-name**—Sets the branch road name.
- **building**—Sets building information.
- **city**—Sets the city name.
- **country**—Sets the two-letter ISO 3166 country code.
- **county**—Sets the county name.
- **default**—Sets a command to its defaults.
- **division**—Sets the city division name.
- **exit**—Exits from the civic location configuration mode.
- **floor**—Sets the floor number.
- **landmark**—Sets landmark information.
- **leading-street-dir**—Sets the leading street direction.
- **name**—Sets the resident name.
- **neighborhood**—Sets neighborhood information.
- **no**—Negates the specified civic location data and sets the default value.
- **number**—Sets the street number.
- **post-office-box**—Sets the post office box.
- **postal-code**—Sets the postal code.
- **postal-community-name**—Sets the postal community name.
- **primary-road-name**—Sets the primary road name.
- **road-section**—Sets the road section.
- **room**—Sets room information.
- **seat**—Sets seat information.
- **state**—Sets the state name.
- **street-group**—Sets the street group.
- **street-name-postmodifier**—Sets the street name postmodifier.
- **street-name-premodifier**—Sets the street name premodifier.
- **street-number-suffix**—Sets the street number suffix.
- **street-suffix**—Sets the street suffix.
- **sub-branch-road-name**—Sets the sub-branch road name.
- **trailing-street-suffix**—Sets the trailing street suffix.
- **type-of-place**—Sets the type of place.

- **unit**—Sets the unit.

You can specify the following geo-spatial location information in geo-location configuration mode:

- **altitude**—Sets altitude information in units of floor, meters, or feet.
- **latitude**—Sets latitude information in degrees, minutes, and seconds. The range is from -90 degrees to 90 degrees. Positive numbers indicate locations north of the equator.
- **longitude**—Sets longitude information in degrees, minutes, and seconds. The range is from -180 degrees to 180 degrees. Positive numbers indicate locations east of the prime meridian.
- **resolution**—Sets the resolution for latitude and longitude. If the resolution value is not specified, default value of 10 meters is applied to latitude and longitude resolution parameters. For latitude and longitude, the resolution unit is measured in meters. The resolution value can also be a fraction.
- **default**—Sets the geographical location to its default attribute.
- **exit**—Exits from geographical location configuration mode.
- **no**—Negates the specified geographical parameters and sets the default value.

Use the **no lldp med-tlv-select location information** interface configuration command to disable the location TLV. The location TLV is enabled by default.

## Examples

This example shows how to configure civic location information on the switch:

```
Switch(config)# location civic-location identifier 1
Switch(config-civic)# number 3550
Switch(config-civic)# primary-road-name "Cisco Way"
Switch(config-civic)# city "San Jose"
Switch(config-civic)# state CA
Switch(config-civic)# building 19
Switch(config-civic)# room C6
Switch(config-civic)# county "Santa Clara"
Switch(config-civic)# country US
Switch(config-civic)# end
```

You can verify your settings by entering the **show location civic-location** privileged EXEC command.

This example shows how to configure the emergency location information on the switch:

```
Switch(config)# location elin-location 14085553881 identifier 1
```

You can verify your settings by entering the **show location elin** privileged EXEC command.

The example shows how to configure geo-spatial location information on the switch:

```
Switch(config)# location geo-location identifier host
Switch(config-geo)# latitude 12.34
Switch(config-geo)# longitude 37.23
Switch(config-geo)# altitude 5 floor
Switch(config-geo)# resolution 12.34
```

You can use the **show location geo-location identifier** command to display the configured geo-spatial location details.

# location algorithm

To configure the algorithm used to average RSSI and SNR values, use the **location algorithm** command in global configuration mode. To remove the algorithm used to average RSSI and SNR values, use the **no** form of this command.

```
location algorithm { rssi-average | simple }
```

```
no location algorithm { rssi-average | simple }
```

## Syntax Description

<b>rssi-average</b>	Specifies a more accurate algorithm but with more CPU overhead.
<b>simple</b>	Specifies faster algorithm with smaller CPU overhead but less accuracy.

## Command Default

RSSI average

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to configure a more accurate algorithm but with more CPU overhead:

```
Switch# configure terminal
Switch(config)# location algorithm rssi-average
Switch(config)# end
```

# location expiry

To configure the timeout for RSSI values, use the **location expiry** command in global configuration mode.

**location expiry** { **calibrating-client** | **client** | **rogue-aps** | **tags** } *timeout-value*

## Syntax Description

<b>calibrating-client</b>	Specifies the RSSI timeout value for calibrating clients.
<b>client</b>	(Optional) Specifies the RSSI timeout value for clients.
<b>rogue-aps</b>	Specifies the RSSI timeout value for rogue access points.
<b>tags</b>	Specifies the RSSI timeout value for RFID tags.
<i>timeout-value</i>	The valid range for the timeout parameter for calibrating clients is 1 to 3600 seconds, and the default value is 5 seconds.  The valid range for the timeout parameter for clients, rogue access points, and RFID tags is 5 to 3600 seconds, and the default value is 5 seconds.

## Command Default

No default behavior or values.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to set the RSSI timeout value for wireless clients:

```
Switch# configure terminal
Switch(config)# location expiry client 1000
Switch(config)# end
```



# location notify-threshold

To configure the NMSP notification threshold for RSSI measurements, use the **location notify-threshold** command in global configuration mode. To remove the NMSP notification threshold for RSSI measurements, use the **no** form of this command.

**location notify-threshold** {client | rogue-aps | tags } *db*

**no location notify-threshold** {client | rogue-aps | tags }

## Syntax Description

<b>client</b>	Specifies the NMSP notification threshold (in dB) for clients and rogue clients. The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.
<b>rogue-aps</b>	Specifies the NMSP notification threshold (in dB) for rogue access points. The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.
<b>tags</b>	Specifies the NMSP notification threshold (in dB) for RFID tags. The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.
<i>db</i>	The valid range for the threshold parameter is 0 to 10 dB, and the default value is 0 dB.

## Command Default

No default behavior or values.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to configure the NMSP notification threshold to 10 dB for clients. A notification NMSP message is sent to MSE as soon as the client RSSI changes by 10 dB:

```
Switch# configure terminal
Switch(config)# location notify-threshold client 10
Switch(config)# end
```

# location plm calibrating

To configure path loss measurement (CCX S60) request for calibrating clients, use the **location plm calibrating** command in global configuration mode.

**location plm calibrating** {**multiband** | **uniband**}

## Syntax Description

<b>multiband</b>	Specifies the path loss measurement request for calibrating clients on the associated 802.11a or 802.11b/g radio.
<b>uniband</b>	Specifies the path loss measurement request for calibrating clients on the associated 802.11a/b/g radio.

## Command Default

No default behavior or values.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

The uniband is useful for single radio clients (even if the radio is a dual band and can operate in the 2.4-GHz and the 5-GHz bands). The multiband is useful for multiple radio clients.

## Examples

This example shows how to configure the path loss measurement request for calibrating clients on the associated 802.11a/b/g radio:

```
Switch# configure terminal
Switch(config)# location plm calibrating uniband
Switch(config)# end
```

## location rfid

To configure RFID tag tracking for a location, use the **location rfid** command in global configuration mode. To remove a RFID tag tracking for a location, use the **no** form of this command.

```
location rfid { status| timeout seconds| vendor-name name}
```

```
no location rfid { status| timeout seconds| vendor-name}
```

### Syntax Description

<b>status</b>	Enables location tracking for RFID tags. The <b>no location rfid status</b> command disables location tracking for tags.
<b>timeout <i>seconds</i></b>	Specifies the location RFID timeout value. Determines the amount of time for which a detected RFID location information is considered as valid. Any RSSI change (below the RSSI threshold) in the configured interval do not result in a new location computation and a message is sent to the MSE. The valid timeout range is from 60 through 7200 seconds.
<b>vendor-name <i>name</i></b>	Specifies the RFID tag vendor name.

### Command Default

No default behavior or values.

### Command Modes

Global configuration

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Usage Guidelines

The **no location rfid status** command disables location RFID status. The **no location rfid timeout** command returns to the default timeout value. The **no location rfid vendor-name** disables tracking for a particular vendor.

### Examples

The example shows how to configure the static RFID tag data timeout:

```
Switch# configure terminal
Switch(config)# location rfid timeout 1000
Switch(config)# end
```

## location rssi-half-life

To configure the RSSI half life for various devices, use the **location rssi-half-life** command in global configuration mode. To remove a RSSI half life for various devices, use the **no** form of this command.

**location rssi-half-life** {**calibrating-client** | **client** | **rogue-aps** | **tags** } *seconds*

**no location rssi-half-life** {**calibrating-client** | **client** | **rogue-aps** | **tags** }

### Syntax Description

<b>calibrating-client</b>	Specifies the RSSI half life for calibrating clients.
<b>client</b>	Specifies the RSSI half life for clients.
<b>rogue-aps</b>	Specifies the RSSI half life for rogue access points.
<b>tags</b>	Specifies the RSSI half life for RFID tags.
<i>seconds</i>	The valid range for the half-life parameter is 0, 1, 2, 5, 10, 20, 30, 60, 90, 120, 180, or 300 seconds, and the default value is 0 seconds.

### Command Default

No default behavior or values.

### Command Modes

Global configuration

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Examples

This example shows how to configure the half life value for a client RSSI to 100 seconds:

```
Switch# configure terminal
Switch(config)# location rssi-half-life client 100
Switch(config)# end
```

## mac address-table move update

To enable the MAC address table move update feature, use the **mac address-table move update** command in global configuration mode on the switch stack or on a standalone switch. To return to the default setting, use the **no** form of this command.

**mac address-table move update** {receive | transmit}

**no mac address-table move update** {receive | transmit}

### Syntax Description

<b>receive</b>	Specifies that the switch processes MAC address-table move update messages.
<b>transmit</b>	Specifies that the switch sends MAC address-table move update messages to other switches in the network if the primary link goes down and the standby link comes up.

### Command Default

By default, the MAC address-table move update feature is disabled.

### Command Modes

Global configuration

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Usage Guidelines

The MAC address-table move update feature allows the switch to provide rapid bidirectional convergence if a primary (forwarding) link goes down and the standby link begins forwarding traffic.

You can configure the access switch to send the MAC address-table move update messages if the primary link goes down and the standby link comes up. You can configure the uplink switches to receive and process the MAC address-table move update messages.

### Examples

This example shows how to configure an access switch to send MAC address-table move update messages:

```
Switch# configure terminal
Switch(config)# mac address-table move update transmit
Switch(config)# end
```

This example shows how to configure an uplink switch to get and process MAC address-table move update messages:

```
Switch# configure terminal
Switch(config)# mac address-table move update receive
Switch(config)# end
```

You can verify your setting by entering the **show mac address-table move update** privileged EXEC command.

# mgmt\_init

To initialize the Ethernet management port, use the **mgmt\_init** command in boot loader mode.

**mgmt\_init**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Boot loader

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines** Use the **mgmt\_init** command only during debugging of the Ethernet management port.

**Examples** This example shows how to initialize the Ethernet management port:

```
Switch: mgmt_init
```

# mkdir

To create one or more directories on the specified file system, use the **mkdir** command in boot loader mode.

**mkdir** *filesystem:/directory-url...*

## Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks.
<i>/directory-url...</i>	Name of the directories to create. Separate each directory name with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Directory names are case sensitive.

Directory names are limited to 127 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

## Examples

This example shows how to make a directory called Saved\_Configs:

```
Switch: mkdir usbflash0:Saved_Configs
Directory "usbflash0:Saved_Configs" created
```

## Related Commands

Command	Description
<a href="#">dir</a>	Displays the list of files and directories on the specified file system.
<a href="#">rmdir</a>	Removes one or more empty directories from the specified file system.



## more

To display the contents of one or more files, use the **more** command in boot loader mode.

**more** *filesystem:/file-url...*

### Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>flash:</b> for the system board flash device.
<i>/file-url...</i>	Path (directory) and name of the files to display. Separate each filename with a space.

### Command Default

No default behavior or values.

### Command Modes

Boot loader

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Usage Guidelines

Filenames and directory names are case sensitive.

If you specify a list of files, the contents of each file appears sequentially.

### Examples

This example shows how to display the contents of a file:

```
Switch: more flash:image_file_name
version_suffix: universal-122-xx.SEx
version_directory: image_file_name
image_system_type_id: 0x00000002
image_name: image_file_name.bin
ios_image_file_size: 8919552
total_image_file_size: 11592192
image_feature: IP|LAYER_3|PLUS|MIN_DRAM_MEG=128
image_family: family
stacking_number: 1.34
board_ids: 0x00000068 0x00000069 0x0000006a 0x0000006b
info_end:
```

## nmosp notification interval

To modify the Network Mobility Services Protocol (NMSP) notification interval value on the controller to address latency in the network, use the **nmosp notification interval** command in global configuration mode.

```
nmosp notification interval { attachment | location | rssi {clients | rfid | rogues {ap | client } } }
```

### Syntax Description

<b>attachment</b>	Specifies the time used to aggregate attachment information.
<b>location</b>	Specifies the time used to aggregate location information.
<b>rssi</b>	Specifies the time used to aggregate RSSI information.
<b>clients</b>	Specifies the time interval for clients.
<b>rfid</b>	Specifies the time interval for rfid tags.
<b>rogues</b>	Specifies the time interval for rogue APs and rogue clients .
<b>ap</b>	Specifies the time used to aggregate rogue APs .
<b>client</b>	Specifies the time used to aggregate rogue clients.

### Command Default

No default behavior or values.

### Command Modes

Global configuration

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Examples

This example shows how to set the NMSP notification interval for the active RFID tags to 25 seconds:

```
Switch# configure terminal
Switch(config)# nmosp notification-interval rfid 25
Switch(config)# end
```

This example shows how to modify NMSP notification intervals for device attachment (connecting to the network or disconnecting from the network) every 10 seconds:

```
Switch# configure terminal
```

```
Switch(config)# nmsp notification-interval attachment 10  
Switch(config)# end
```

This example shows how to configure NMSP notification intervals for location parameters (location change) every 20 seconds:

```
Switch# configure terminal  
Switch(config)# nmsp notification-interval location 20  
Switch(config)# end
```

# rename

To rename a file, use the **rename** command in boot loader mode.

```
rename filesystem:/source-file-url filesystem:/destination-file-url
```

## Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks.
<i>/source-file-url</i>	Original path (directory) and filename.
<i>/destination-file-url</i>	New path (directory) and filename.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Filenames and directory names are case sensitive.

Directory names are limited to 127 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

Filenames are limited to 127 characters; the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

## Examples

This example shows a file named *config.text* being renamed to *config1.text*:

```
Switch: rename usbflash0:config.text usbflash0:config1.text
```

You can verify that the file was renamed by entering the **dir** *filesystem:* boot loader command.

# reset

To perform a hard reset on the system, use the **reset** command in boot loader mode. A hard reset is similar to power-cycling the switch; it clears the processor, registers, and memory.

**reset**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Boot loader

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** This example shows how to reset the system:

```
Switch: reset
Are you sure you want to reset the system (y/n)? y
System resetting...
```

Related Commands	Command	Description
	<a href="#">reset</a>	Performs a hard reset on the system.
	<a href="#">test cable-diagnostics tdr</a>	Runs the Time Domain Reflector (TDR) feature on an interface.

# rmdir

To remove one or more empty directories from the specified file system, use the **rmdir** command in boot loader mode.

**rmdir** *filesystem:/directory-url...*

## Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>usbflash0:</b> for USB memory sticks.
<i>/directory-url...</i>	Path (directory) and name of the empty directories to remove. Separate each directory name with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Directory names are case sensitive and limited to 45 characters between the slashes (/); the name cannot contain control characters, spaces, deletes, slashes, quotes, semicolons, or colons.

Before removing a directory, you must first delete all of the files in the directory.

The switch prompts you for confirmation before deleting each directory.

## Examples

This example shows how to remove a directory:

```
Switch: rmdir usbflash0:Test
```

You can verify that the directory was deleted by entering the **dir** *filesystem:* boot loader command.

## Related Commands

Command	Description
<a href="#">dir</a>	Displays the list of files and directories on the specified file system.

# sdm prefer

To specify the SDM template for use on the switch, use the **sdm prefer** command in global configuration mode.

**sdm prefer** {advanced}

## Syntax Description

<b>advanced</b>	Supports advanced features such as NetFlow.
-----------------	---

## Command Default

No default behavior or values.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

In a switch stack, all stack members must use the same SDM template that is stored on the active switch. When a new switch is added to a stack, the SDM configuration that is stored on the active switch overrides the template configured on an individual switch.

## Examples

This example shows how to configure the advanced template:

```
Switch(config)# sdm prefer advanced
Switch(config)# exit
Switch# reload
```

## Related Commands

Command	Description
<a href="#">show sdm prefer</a>	Displays the SDM template in use.

# set

To set or display environment variables, use the **set** command in boot loader mode. Environment variables can be used to control the boot loader or any other software running on the switch.

**set** *variable value*

## Syntax Description

<i>variable</i>	Use one of the following keywords for <i>variable</i> and the appropriate value for <i>value</i> :
<i>value</i>	<p><b>MANUAL_BOOT</b>—Decides whether the switch automatically or manually boots. Valid values are 1/Yes and 0/No. If it is set to 0 or No, the boot loader attempts to automatically boot the system. If it is set to anything else, you must manually boot the switch from the boot loader mode.</p> <hr/> <p><b>BOOT</b> <i>filesystem:/file-url</i>—Identifies a semicolon-separated list of executable files to try to load and execute when automatically booting. If the BOOT environment variable is not set, the system attempts to load and execute the first executable image it can find by using a recursive, depth-first search through the flash: file system. If the BOOT variable is set but the specified images cannot be loaded, the system attempts to boot the first bootable file that it can find in the flash: file system.</p> <hr/> <p><b>ENABLE_BREAK</b>—Allows the automatic boot process to be interrupted when the user presses the <b>Break</b> key on the console. Valid values are 1, Yes, On, 0, No, and Off. If set to 1, Yes, or On, you can interrupt the automatic boot process by pressing the <b>Break</b> key on the console after the flash: file system has initialized.</p> <hr/> <p><b>HELPER</b> <i>filesystem:/file-url</i>—Identifies a semicolon-separated list of loadable files to dynamically load during the boot loader initialization. Helper files extend or patch the functionality of the boot loader.</p> <hr/> <p><b>PS1</b> <i>prompt</i>—Specifies a string that is used as the command-line prompt in boot loader mode.</p> <hr/> <p><b>CONFIG_FILE</b> <b>flash:</b> <i>/file-url</i>—Specifies the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration.</p> <hr/> <p><b>BAUD</b> <i>rate</i>—Specifies the number of bits per second (b/s) that is used for the baud rate for the console. The Cisco IOS software inherits the baud rate setting from the boot loader and continues to use this value unless the configuration file specifies another setting. The range is from 0 to 128000 b/s. Valid values are 50, 75, 110, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 56000, 57600, 115200, and 128000. The most commonly used values are 300, 1200, 2400, 9600, 19200, 57600, and 115200.</p> <hr/> <p><b>SWITCH_NUMBER</b> <i>stack-member-number</i>—Changes the member number of a stack member.</p> <hr/> <p><b>SWITCH_PRIORITY</b> <i>priority-number</i>—Changes the priority value of a stack member.</p>



**Command Default**

The environment variables have these default values:

MANUAL\_BOOT: No (0)

BOOT: Null string

ENABLE\_BREAK: No (Off or 0) (the automatic boot process cannot be interrupted by pressing the **Break** key on the console).

HELPER: No default value (helper files are not automatically loaded).

PS1 switch:

CONFIG\_FILE: config.text

BAUD: 9600 b/s

SWITCH\_NUMBER: 1

SWITCH\_PRIORITY: 1

**Note**

Environment variables that have values are stored in the flash: file system in various files. Each line in the files contains an environment variable name and an equal sign followed by the value of the variable.

A variable has no value if it is not listed in these files; it has a value if it is listed even if the value is a null string. A variable that is set to a null string (for example, “ ”) is a variable with a value.

Many environment variables are predefined and have default values.

**Command Modes**

Boot loader

**Command History**

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines**

Environment variables are case sensitive and must be entered as documented.

Environment variables that have values are stored in flash memory outside of the flash: file system.

Under typical circumstances, it is not necessary to alter the setting of the environment variables.

The MANUAL\_BOOT environment variable can also be set by using the **boot manual** global configuration command.

The BOOT environment variable can also be set by using the **boot system filesystem:/file-url** global configuration command.

The ENABLE\_BREAK environment variable can also be set by using the **boot enable-break** global configuration command.

The HELPER environment variable can also be set by using the **boot helper filesystem: /file-url** global configuration command.

The CONFIG\_FILE environment variable can also be set by using the **boot config-file flash:** */file-url* global configuration command.

The SWITCH\_NUMBER environment variable can also be set by using the **switch** *current-stack-member-number* **renumber** *new-stack-member-number* global configuration command.

The SWITCH\_PRIORITY environment variable can also be set by using the switch *stack-member-number* **priority** *priority-number* global configuration command.

The boot loader prompt string (PS1) can be up to 120 printable characters not including the equal sign (=).

### Examples

This example shows how to set the SWITCH\_PRIORITY environment variable:

```
Switch: set SWITCH_PRIORITY 2
```

You can verify your setting by using the **set** boot loader command.

### Related Commands

Command	Description
<a href="#">reset</a>	Performs a hard reset on the system.
<a href="#">unset</a>	Resets one or more environment variables.

# show avc client

To display information about top number of applications, use the **show avc client** command in privileged EXEC mode.

```
show avc client client-mac top n application [aggregate | upstream | downstream]
```

## Syntax Description

<b>client</b> <i>client-mac</i>	Specifies the client MAC address.
<b>top</b> <i>n</i> <b>application</b>	Specifies the number of top "N" applications for the given client.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

## Examples

The following is sample output from the **show avc client** command:

```
Switch# sh avc client 0040.96ae.65ec top 10 application aggregate
```

Cumulative Stats:

No.	AppName	Packet-Count	Byte-Count	AvgPkt-Size	usage%
1	skinny	7343	449860	61	94
2	unknown	99	13631	137	3
3	dhcp	18	8752	486	2
4	http	18	3264	181	1
5	tftp	9	534	59	0
6	dns	2	224	112	0

Last Interval (90 seconds) Stats:

No.	AppName	Packet-Count	Byte-Count	AvgPkt-Size	usage%
1	skinny	9	540	60	100

## show avc wlan

To display information about top applications and users using the applications, use the **show avc wlan** command in privileged EXEC mode.

**show avc wlan ssid top n application** [aggregate | upstream | downstream]

### Syntax Description

<b>wlan ssid</b>	Specifies the Service Set Identifier (SSID) for WLAN.
<b>top n application</b>	Specifies the number of top "N" applications.

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

### Examples

The following is sample output from the **show avc wlan** command:

```
Switch# show avc wlan Lobby_WLAN top 10 application aggregate
```

Cumulative Stats:

No.	AppName	Packet-Count	Byte-Count	AvgPkt-Size	usage%
1	ssl	10598677	1979525706	997	42
2	vnc	5550900	3764612847	678	14
3	http	3043131	2691327197	884	10
4	unknown	1856297	1140264956	614	4
5	video-over-http	1625019	2063335150	1269	8
6	binary-over-http	1329115	1744190344	1312	6
7	webex-meeting	1146872	540713787	471	2
8	rtp	923900	635650544	688	2
9	unknown	752341	911000213	1210	3
10	youtube	631085	706636186	1119	3

Last Interval (90 seconds) Stats:

No.	AppName	Packet-Count	Byte-Count	AvgPkt-Size	usage%
1	vnc	687093	602731844	877	68
2	video-over-http	213272	279831588	1312	31
3	ssl	6515	5029365	771	1
4	webex-meeting	3649	1722663	472	0
5	http	2634	1334355	506	0
6	unknown	1436	99412	69	0
7	google-services	722	378121	523	0
8	linkedin	655	393263	600	0
9	exchange	432	167390	387	0

10	gtalk-chat	330	17330	52	0
----	------------	-----	-------	----	---

# show cable-diagnostics tdr

To display the Time Domain Reflector (TDR) results, use the **show cable-diagnostics tdr** command in privileged EXEC mode.

**show cable-diagnostics tdr interface** *interface-id*

## Syntax Description

<i>interface-id</i>	Specifies the interface on which TDR is run.
---------------------	--

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

TDR is supported only on 10/100/100 copper Ethernet ports. It is not supported on 10-Gigabit Ethernet ports and small form-factor pluggable (SFP) module ports.

## Examples

This example shows the output from the **show cable-diagnostics tdr interface** *interface-id* command on a switch:

```
Switch# show cable-diagnostics tdr interface gigabitethernet1/0/23
TDR test last run on: March 01 00:04:08
Interface  Speed  Local pair  Pair length  Remote pair  Pair status
-----
Gi1/0/23  1000M  Pair A     1 +/- 1 meters  Pair A     Normal
           Pair B     1 +/- 1 meters  Pair B     Normal
           Pair C     1 +/- 1 meters  Pair C     Normal
           Pair D     1 +/- 1 meters  Pair D     Normal
```

**Table 5: Field Descriptions for the show cable-diagnostics tdr Command Output**

Field	Description
Interface	The interface on which TDR is run.
Speed	The speed of connection.
Local pair	The name of the pair of wires that TDR is testing on the local interface.

Field	Description
Pair length	<p>The location of the problem on the cable, with respect to your switch. TDR can only find the location in one of these cases:</p> <ul style="list-style-type: none"> <li>• The cable is properly connected, the link is up, and the interface speed is 1000 Mb/s.</li> <li>• The cable is open.</li> <li>• The cable has a short.</li> </ul>
Remote pair	<p>The name of the pair of wires to which the local pair is connected. TDR can learn about the remote pair only when the cable is properly connected and the link is up.</p>
Pair status	<p>The status of the pair of wires on which TDR is running:</p> <ul style="list-style-type: none"> <li>• Normal—The pair of wires is properly connected.</li> <li>• Not completed—The test is running and is not completed.</li> <li>• Not supported—The interface does not support TDR.</li> <li>• Open—The pair of wires is open.</li> <li>• Shorted—The pair of wires is shorted.</li> <li>• ImpedanceMis—The impedance is mismatched.</li> <li>• Short/Impedance Mismatched—The impedance mismatched or the cable is short.</li> <li>• InProgress—The diagnostic test is in progress.</li> </ul>

This example shows the output from the **show interface** *interface-id* command when TDR is running:

```
Switch# show interface gigabitethernet1/0/2
gigabitethernet1/0/2 is up, line protocol is up (connected: TDR in Progress)
```

This example shows the output from the **show cable-diagnostics tdr interface** *interface-id* command when TDR is not running:

```
Switch# show cable-diagnostics tdr interface gigabitethernet1/0/2
% TDR test was never issued on gigabitethernet1/0/2
```

If an interface does not support TDR, this message appears:

```
% TDR test is not supported on switch 1
```

**Related Commands**

Command	Description
<a href="#">test cable-diagnostics tdr</a>	Runs the Time Domain Reflector (TDR) feature on an interface.



# show env

To display fan, temperature, and power information for the switch (standalone switch, stack master, or stack member), use the **show env** command in EXEC modes.

```
show env { all | fan | power [all | switch [switch-number]] | stack [stack-number ] | temperature [status] }
```

## Syntax Description

<b>all</b>	Displays fan, temperature and power environmental status.
<b>fan</b>	Displays the switch fan status.
<b>power</b>	Displays the power supply status.
<b>all</b>	(Optional) Displays the status for all power supplies.
<b>switch</b> <i>switch-number</i>	(Optional) Displays the power supply status for a specific switch.
<b>stack</b> <i>switch-number</i>	(Optional) Displays all environmental status for each switch in the stack or for a specified switch. The range is 1 to 9, depending on the switch member numbers in the stack.
<b>temperature</b>	Displays the switch temperature status.
<b>status</b>	(Optional) Displays the temperature status and threshold values.

## Command Default

No default behavior or values.

## Command Modes

User EXEC  
Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Use the **show env stack** [*switch-number*] command to display information about any switch in the stack from any member switch.

Use the **show env temperature status** command to display the switch temperature states and threshold levels.

**Examples**

This example shows how to display information about stack member 1 from the master switch:

```
Switch> show env stack 1
Switch 1:
Switch Fan 1 is OK
Switch Fan 2 is OK
Switch Fan 3 is OK
FAN-PS1 is OK
FAN-PS2 is NOT PRESENT
Switch 1: SYSTEM TEMPERATURE is OK
Temperature Value: 32 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 41 Degree Celsius
Red Threshold : 56 Degree Celsius

Switch>
```

This example shows how to display temperature value, state, and threshold values:

```
Switch> show env temperature status
Temperature Value: 32 Degree Celsius
Temperature State: GREEN
Yellow Threshold : 41 Degree Celsius
Red Threshold : 56 Degree Celsius

Switch>
```

**Table 6: States in the show env temperature status Command Output**

State	Description
Green	The switch temperature is in the <i>normal</i> operating range.
Yellow	The temperature is in the <i>warning</i> range. You should check the external temperature around the switch.
Red	The temperature is in the <i>critical</i> range. The switch might not run properly if the temperature is in this range.

# show flow monitor

To display the status and statistics for a flow monitor, use the **show flow monitor** command in privileged EXEC mode.

## Syntax Description

<b>name</b>	(Optional) Specifies the name of a flow monitor.
<i>monitor-name</i>	(Optional) Name of a flow monitor that was previously configured.
<b>cache</b>	(Optional) Displays the contents of the cache for the flow monitor.
<b>format</b>	(Optional) Specifies the use of one of the format options for formatting the display output.
<b>csv</b>	(Optional) Displays the flow monitor cache contents in comma-separated variables (CSV) format.
<b>record</b>	(Optional) Displays the flow monitor cache contents in record format.
<b>table</b>	(Optional) Displays the flow monitor cache contents in table format.
<b>statistics</b>	(Optional) Displays the statistics for the flow monitor.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

The **cache** keyword uses the record format by default.

The uppercase field names in the display output of the **show flowmonitor** *monitor-name* **cache** command are key fields that uses to differentiate flows. The lowercase field names in the display output of the **show flow monitor** *monitor-name* **cache** command are nonkey fields from which collects values as additional data for the cache.

## Examples

The following example displays the status for a flow monitor:

```
Switch# show flow monitor FLOW-MONITOR-1

Flow Monitor FLOW-MONITOR-1:
  Description:      Used for basic traffic analysis
  Flow Record:     flow-record-1
  Flow Exporter:   flow-exporter-1
                  flow-exporter-2
```

```

Cache:
  Type:          normal
  Status:        allocated
  Size:          4096 entries / 311316 bytes
  Inactive Timeout: 15 secs
  Active Timeout: 1800 secs

```

This table describes the significant fields shown in the display.

**Table 7: show flow monitor monitor-name Field Descriptions**

Field	Description
Flow Monitor	Name of the flow monitor that you configured.
Description	Description that you configured or the monitor, or the default description User defined.
Flow Record	Flow record assigned to the flow monitor.
Flow Exporter	Exporters that are assigned to the flow monitor.
Cache	Information about the cache for the flow monitor.
Type	Flow monitor cache type. The value is always normal, as it is the only supported cache type.
Status	Status of the flow monitor cache. The possible values are: <ul style="list-style-type: none"> <li>• allocated—The cache is allocated.</li> <li>• being deleted—The cache is being deleted.</li> <li>• not allocated—The cache is not allocated.</li> </ul>
Size	Current cache size.
Inactive Timeout	Current value for the inactive timeout in seconds.
Active Timeout	Current value for the active timeout in seconds.

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-1:

This table describes the significant fields shown in the display.

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-1 in a table format:

The following example displays the status, statistics, and data for the flow monitor named FLOW-MONITOR-IPv6 (the cache contains IPv6 data) in record format:

The following example displays the status and statistics for a flow monitor:

# show license right-to-use

To display detailed information for account adder licenses installed on the switch, use the **show license right-to-use** command in EXEC modes.

**show license right-to-use** {**default** | **detail** | **eula** | **mismatch** | **slot** | **summary** | **usage**}

## Syntax Description

<b>default</b>	Displays the default license information.
<b>detail</b>	Displays details of all the licenses in the stack.
<b>eula</b>	Displays the EULA text.
<b>mismatch</b>	Displays mismatch license information.
<b>slot</b>	Specifies the switch number.
<b>summary</b>	Displays consolidated stack-wide license information.
<b>usage</b>	Displays the usage details of all licenses.

## Command Default

No default behavior or values.

## Command Modes

User EXEC  
Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show license right-to-use usage** command and displays all the detailed information:

Switch# **show license right-to-use usage**

Slot#	License Name	Type	usage-duration (y:m:d)	In-Use	EULA
1	ipservices	permanent	0 :0 :1	yes	yes
1	ipbase	permanent	0 :0 :0	no	no
1	ipbase	evaluation	0 :0 :0	no	no
1	lanbase	permanent	0 :0 :7	no	yes
1	apcount	evaluation	0 :0 :0	no	no
1	apcount	base	0 :0 :0	no	no
1	apcount	adder	0 :0 :0	no	yes
1	apcount	adder	0 :0 :0	no	yes

## show license right-to-use

```

1      apcount      adder      0 :0 :0      no      yes
1      apcount      adder      0 :0 :0      no      yes
1      apcount      adder      0 :0 :0      no      yes

```

Switch#

The following is sample output from the **show license right-to-use detail** command and displays the detailed information of licenses:

Switch# **show license right-to-use detail**

```

Index 1: License Name: apcount
          Period left: 16
          License Type: evaluation
          License State: Not Activated
          License Count: 1000
          License Location: Slot 1
Index 2: License Name: apcount
          Period left: Lifetime
          License Type: adder
          License State: Active, In use
          License Count: 125
          License Location: Slot 1

```

The following is sample output from the **show license right-to-use summary** command when the evaluation license is active:

```

Switch# show license right-to-use summary
License Name   Type      Count    Period left
-----
apcount        evaluation 1000     50
-----

Evaluation AP-Count: Enabled
Total AP Count Licenses: 1000
AP Count Licenses In-use: 100
AP Count Licenses Remaining: 900

```

The following is sample output from the **show license right-to-use summary** command when the adder licenses are active:

```

Switch# show license right-to-use summary
License Name   Type      Count    Period left
-----
apcount        adder      125     Lifetime
-----

Evaluation AP-Count: Disabled
Total AP Count Licenses: 125
AP Count Licenses In-use: 100
AP Count Licenses Remaining: 25

```

# show location

To display location information, use the **show location** command in privileged EXEC mode.

```
show location {detail mac-addr} plm| statistics| summary rfid| rfid {client| config} detail MAC-addr|
summary}}
```

## Syntax Description

<b>detail</b> <i>mac-addr</i>	Displays detailed location information with the RSSI table for a particular client.
<b>plm</b>	Displays location path loss measurement (CCX S60) configuration.
<b>statistics</b>	Displays location-based system statistics.
<b>summary</b>	Displays location-based system summary information.
<b>rfid</b>	Displays the RFID tag tracking information.
<b>client</b>	Displays the summary of RFID tags that are clients.
<b>config</b>	Displays the configuration options for RFID tag tracking.
<b>detail</b> <i>MAC-addr</i>	Displays the detailed information for one rfid tag.
<b>summary</b>	Displays summary information for all known rfid tags.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show location plm** command:

```
Switch# show location plm
Location Path Loss Configuration

Calbration client      : Disabled, Radio: Multiband
Normal clients        : Disabled
Burst interval        : 60
```

## show location ap-detect

To display the location information detected by specified access point, use the **show location ap-detect** command in privileged EXEC mode.

**show location ap-detect** {all| client| rfid| rogue-ap| rogue-client} *ap-name*

### Syntax Description

<b>all</b>	Displays information of the client, RFID, rogue access point, and rogue client.
<b>client</b>	Displays the client information.
<b>rfid</b>	Displays RFID information.
<b>rogue-ap</b>	Displays rogue access point information.
<b>rogue-client</b>	Displays rogue client information.
<i>ap-name</i>	Specified access point name.

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Examples

The following is sample output from the **show location ap-detect client** command:

```
Switch# show location ap-detect client AP02
Clients
-----
MAC Address      Status           Slot  Antenna  RSSI
-----
2477.0389.96ac   Associated       1     0        -60
2477.0389.96ac   Associated       1     1        -61
2477.0389.96ac   Associated       0     0        -46
2477.0389.96ac   Associated       0     1        -41

RFID Tags

Rogue AP's
```



## Rogue Clients

MAC Address	State	Slot	Rssi
0040.96b3.bce6	Alert	1	-58
586d.8ff0.891a	Alert	1	-72

# show mac address-table move update

To display the MAC address-table move update information on the switch, use the **show mac address-table move update** command in EXEC mode.

**show mac address-table move update**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** User EXEC  
Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** This example shows the output from the **show mac address-table move update** command:

```
Switch# show mac address-table move update

Switch-ID : 010b.4630.1780
Dst mac-address : 0180.c200.0010
Vlans/Macs supported : 1023/8320
Default/Current settings: Rcv Off/On, Xmt Off/On
Max packets per min : Rcv 40, Xmt 60
Rcv packet count : 10
Rcv conforming packet count : 5
Rcv invalid packet count : 0
Rcv packet count this min : 0
Rcv threshold exceed count : 0
Rcv last sequence# this min : 0
Rcv last interface : Po2
Rcv last src-mac-address : 0003.fd6a.8701
Rcv last switch-ID : 0303.fd63.7600
Xmt packet count : 0
Xmt packet count this min : 0
Xmt threshold exceed count : 0
Xmt pak buf unavail cnt : 0
Xmt last interface : None
```

# show nmosp

To display the Network Mobility Services Protocol (NMSP) configuration settings, use the **show nmosp** command.

```
show nmosp {attachment | {suppress interfaces}| capability| notification interval| statistics {connection|
summary}| status| subscription detail [ip-addr ]| summary}
```

## Syntax Description

<b>attachment suppress interfaces</b>	Displays attachment suppress interfaces.
<b>capability</b>	Displays NMSP capabilities.
<b>notification interval</b>	Displays the NMSP notification interval.
<b>statistics connection</b>	Displays all connection-specific counters.
<b>statistics summary</b>	Displays the NMSP counters.
<b>status</b>	Displays status of active NMSP connections.
<b>subscription detail <i>ip-addr</i></b>	The details are only for the NMSP services subscribed to by a specific IP address.
<b>subscription summary</b>	Displays details for all of the NMSP services to which the controller is subscribed. The details are only for the NMSP services subscribed to by a specific IP address.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show nmosp notification interval** command:

```
Switch# show nmosp notification interval
NMSP Notification Intervals
-----
RSSI Interval:
  Client           : 2 sec
  RFID             : 2 sec
```

**show nmosp**

```
Rogue AP           : 2 sec
Rogue Client       : 2 sec
Attachment Interval : 30 sec
Location Interval  : 30 sec
```

# show sdm prefer

To display information about the templates that can be used to maximize system resources for a particular feature, use the **show sdm prefer** command in privileged EXEC mode. To display the current template, use the command without a keyword.

**show sdm prefer [advanced]**

<b>Syntax Description</b>	<b>advanced</b> (Optional) Displays information on the advanced template.				
<b>Command Default</b>	No default behavior or values.				
<b>Command Modes</b>	Privileged EXEC				
<b>Command History</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Release</th> <th style="text-align: left;">Modification</th> </tr> </thead> <tbody> <tr> <td>Cisco IOS XE 3.2SE</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Cisco IOS XE 3.2SE	This command was introduced.
Release	Modification				
Cisco IOS XE 3.2SE	This command was introduced.				

**Usage Guidelines** If you did not reload the switch after entering the **sdm prefer** global configuration command, the **show sdm prefer** privileged EXEC command displays the template currently in use and not the newly configured template.

The numbers displayed for each template represent an approximate maximum number for each feature resource. The actual number might vary, depending on the actual number of other features configured. For example, in the default template if your switch had more than 16 routed interfaces (subnet VLANs), the number of possible unicast MAC addresses might be less than 6000.

**Examples** The following is sample output from the **show sdm prefer** command:

```
Switch# show sdm prefer
Showing SDM Template Info

This is the Advanced template.
Number of VLANs:                4094
Unicast MAC addresses:          32768
Overflow Unicast MAC addresses:  512
IGMP and Multicast groups:      8192
Overflow IGMP and Multicast groups: 512
Directly connected routes:      32768
Indirect routes:                7680
Security Access Control Entries: 3072
QoS Access Control Entries:      3072
Policy Based Routing ACEs:       1024
Netflow ACEs:                   1024
Input Microflow policer ACEs:    256
```

**show sdm prefer**

```

Output Microflow policer ACEs:          256
Flow SPAN ACEs:                        256
Tunnels:                               256
Control Plane Entries:                 512
Input Netflow flows:                   8192
Output Netflow flows:                  16384
SGT/DGT entries:                       4096
SGT/DGT Overflow entries:              512
These numbers are typical for L2 and IPv4 features.
Some features such as IPv6, use up double the entry size;
so only half as many entries can be created.

```

```
Switch#
```

**Related Commands**

Command	Description
<a href="#">sdm prefer</a>	Specifies the SDM template to be used on the switch.

# show tech-support wireless

To display Cisco wireless LAN controller variables frequently requested by Cisco Technical Assistance Center (TAC), use the **show tech-support wireless** command in privileged EXEC mode.

**show tech-support wireless**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show tech-support wireless** command:

```
Switch# show tech-support wireless
*** show ap capwap timers ***

Cisco AP CAPWAP timers

AP Discovery timer      : 10
AP Heart Beat timeout  : 30
Primary Discovery timer : 120
Primed Join timeout    : 0
Fast Heartbeat         : Disabled
Fast Heartbeat timeout : 1
*** show ap capwap retransmit ***
Global control packet retransmit interval : 3
Global control packet retransmit count : 5

AP Name                               Retransmit Interval      Retransmit Count
-----
TSIM_AP-2                             3                          5
TSIM_AP-3                             3                          5
*** show ap dot11 24ghz cleanair air-quality summary ***

AQ = Air Quality
DFS = Dynamic Frequency Selection

*** show ap dot11 24ghz cleanair air-quality worst ***

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name      Channel  Avg AQ  Min AQ  Interferers  DFS
-----
              0        0        0        0            No

*** show ap dot11 24ghz cleanair config ***

Clean Air Solution..... : Disabled
Air Quality Settings:
```

```

Air Quality Reporting..... : Disabled
Air Quality Reporting Period (min)..... : 15
Air Quality Alarms..... : Enabled
Air Quality Alarm Threshold..... : 10
Interference Device Settings:
  Interference Device Reporting..... : Enabled
  Bluetooth Link..... : Enabled
  Microwave Oven..... : Enabled
  802.11 FH..... : Enabled
  Bluetooth Discovery..... : Enabled
  TDD Transmitter..... : Enabled
  Jammer..... : Enabled
  Continuous Transmitter..... : Enabled
  DECT-like Phone..... : Enabled
  Video Camera..... : Enabled
  802.15.4..... : Enabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Enabled
  Canopy..... : Enabled
  Microsoft Device..... : Enabled
  WiMax Mobile..... : Enabled
  WiMax Fixed..... : Enabled
Interference Device Types Triggering Alarms:
  Bluetooth Link..... : Disabled
  Microwave Oven..... : Disabled
  802.11 FH..... : Disabled
  Bluetooth Discovery..... : Disabled
  TDD Transmitter..... : Disabled
  Jammer..... : Disabled
  Continuous Transmitter..... : Disabled
  DECT-like Phone..... : Disabled
  Video Camera..... : Disabled
802.15.4..... : Disabled
  WiFi Inverted..... : Enabled
  WiFi Invalid Channel..... : Enabled
  SuperAG..... : Disabled
  Canopy..... : Disabled
  Microsoft Device..... : Disabled
  WiMax Mobile..... : Disabled
  WiMax Fixed..... : Disabled
Interference Device Alarms..... : Enabled
Additional Clean Air Settings:
  CleanAir Event-driven RRM State..... : Disabled
  CleanAir Driven RRM Sensitivity..... : LOW
  CleanAir Persistent Devices state..... : Disabled

```



# show wireless band-select

To display the status of the band-select configuration, use the **show wireless band-select** command in privileged EXEC mode.

**show wireless band-select**

## Syntax Description

This command has no arguments or keywords.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show wireless band-select** command:

```
Switch# show wireless band-select
Band Select Probe Response    : per WLAN enabling
Cycle Count                   : 2
Cycle Threshold (millisec)   : 200
Age Out Suppression (sec)    : 20
Age Out Dual Band (sec)      : 60
Client RSSI (dBm)            : 80
```

## show wireless client calls

To display the total number of active or rejected calls on the switch, use the **show wireless client calls** command in privileged EXEC mode.

**show wireless client calls {active | rejected}**

### Syntax Description

<b>active</b>	Displays active calls.
<b>rejected</b>	Displays rejected calls.

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Examples

The following is sample output from the **show wireless client calls** command:

```
switch# show wireless client calls active
```

```
TSPEC Calls:
```

```
-----
MAC Address      AP Name          Status           WLAN  Authenticated
-----
0000.1515.000f  AP-2            Associated       1    Yes
```

```
SIP Calls:
```

```
-----
Number of Active TSPEC calls on 802.11a and 802.11b/g: 1
Number of Active SIP calls on 802.11a and 802.11b/g: 0
```

# show wireless client dot11

To display the total number of active or rejected calls for a specific band (2.4 Ghz or 5 Ghz), use the **show wireless client dot11** command in privileged EXEC mode.

```
show wireless client dot11 {24ghz | 5ghz} calls {active | rejected}
```

Syntax Description		
<b>24ghz</b>		Displays the 802.11b/g network.
<b>5ghz</b>		Displays the 802.11a network.
<b>calls</b>		Displays the wireless client calls.
<b>active</b>		Displays active calls.
<b>rejected</b>		Displays rejected calls.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **show wireless client dot11** command:

```
Switch# show wireless client dot11 5ghz calls active
```

```
  TSPEC Calls:
  -----
```

```
  SIP Calls:
  -----
```

```
Number of Active TSPEC calls on 802.11a: 0
Number of Active SIP calls on 802.11a: 0
```

# show wireless client location-calibration

To display the list of clients currently used to perform location calibration, use the **show wireless client location-calibration** command in privileged EXEC mode.

**show wireless client location-calibration**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **show wireless client location-calibration** command:

```
Switch# show wireless client location-calibration
```

# show wireless client probing

To display the number of probing clients, use the **show wireless client probing** command in privileged EXEC mode.

**show wireless client probing**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **show wireless client probing** command:

```
Switch# show wireless client probing
MAC Address
-----
000b.cd15.0001
000b.cd15.0002
000b.cd15.0003
000b.cd15.0004
000b.cd15.0005
000b.cd15.0006
```

# show wireless client summary

To display a summary of active clients associated with the controller, use the **show wireless client summary** command in privileged EXEC mode.

**show wireless client summary**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines** The following is sample output from the **show wireless client summary** command:  
Use the **show wireless exclusionlist** command to display clients on the exclusion list (blacklisted).

## Examples

```
Switch# show wireless client summary
Number of Local Clients : 1
```

```
MAC Address      AP Name          WLAN State      Protocol
-----
0000.1515.000f  AP-2            1 UP            11a
```

# show wireless client timers

To display 802.11 system timers, use the **show wireless client timers** command in privileged EXEC mode.

**show wireless client timers**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **show wireless client timers** command:

```
Switch# show wireless client timers
Authentication Response Timeout (seconds)      : 10
```

# show wireless client voice diagnostics

To display wireless client voice diagnostic parameters, use the **show wireless client voice diagnostics** command in privileged EXEC mode.

**show wireless client voice diagnostics** {**qos-map** | **roam-history** | **rsi** | **status** | **tspec**}

## Syntax Description

<b>qos-map</b>	Displays information about the QoS and DSCP mapping and packet statistics in each of the four queues: VO, VI, BE, BK. The different DSCP values are also displayed.
<b>roam-history</b>	Displays information about the last 3 roaming histories for each known client. The output contains the timestamp, access point associated with roaming, roaming reason, and if there is a roaming failure, a reason for the roaming failure.
<b>rsi</b>	Displays the client's RSSI values in the last 5 seconds when voice diagnostics are enabled.
<b>status</b>	Displays status of voice diagnostics for clients.
<b>tspec</b>	Displays voice diagnostics that are enabled for TSPEC clients.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Debug voice diagnostics must be enabled for voice diagnostics to work.

## Examples

The following is sample output from the **show wireless client voice diagnostics status** command:

```
Switch# show wireless client voice diagnostics status
Voice Diagnostics Status: FALSE
```



# show wireless country

To display the configured country and the radio types supported, use the **show wireless country** command in privileged EXEC mode.

**show wireless country** {channels| configured| supported [tx-power]}

Syntax Description		
<b>channels</b>	Displays the list of possible channels for each band, and the list of channels allowed in the configured countries.	
<b>configured</b>	Display configured countries.	
<b>supported tx-power</b>	Displays the list of allowed Tx powers in each supported country.	

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **show wireless country channels** command:

```
Switch# show wireless country channels
  Configured Country.....: US - United States
  KEY: * = Channel is legal in this country and may be configured manually.
       A = Channel is the Auto-RF default in this country.
       . = Channel is not legal in this country.
       C = Channel has been configured for use by Auto-RF.
       x = Channel is available to be configured for use by Auto-RF.
       (-,-) = (indoor, outdoor) regulatory domain allowed by this country.
-----:+++++-----
      802.11bg      :
      Channels      :           1 1 1 1 1
                    : 1 2 3 4 5 6 7 8 9 0 1 2 3 4
-----:+++++-----
  (-A , -AB ) US  : A * * * * A * * * * A . . .
  Auto-RF         : . . . . .
-----:+++++-----
      802.11a      :           1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
      Channels      : 3 3 3 4 4 4 4 4 5 5 6 6 0 0 0 1 1 2 2 2 3 3 4 4 5 6 6
                    : 4 6 8 0 2 4 6 8 2 6 0 4 0 4 8 2 6 0 4 8 2 6 0 9 3 7 1 5
-----:+++++-----
  (-A , -AB ) US  : . A . A . A . A A A A * * * * * . . . * * * A A A *
  Auto-RF         : . . . . .
-----:+++++-----
      4.9GHz 802.11a :
      Channels      :           1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2
                    : 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
```



```

(-JPU , -JPU ) J3 : 23 23 23 23 23 23 23 23 23 23 23 23 23 23
(-JPQU, -PQ ) J4 : 23 23 23 23 23 23 23 23 23 23 23 23 23 23
(-E , - ) JO : 20 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-JPU , -JPU ) JP : 23 23 23 23 23 23 23 23 23 23 23 23 23 23
(-ACE , -ACEK) KE : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) KN : 20 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-ACE , -ACEK) KR : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) KW : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) KZ : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) LB : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) LI : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) LK : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) LT : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) LU : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) LV : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) MC : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) ME : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) MK : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) MO : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) MT : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-A , -NA ) MX : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-ACE , -AEC ) MY : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) NL : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) NO : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-A , -NA ) NZ : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-E , -E ) OM : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-A , -AR ) PA : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , -AR ) PE : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , -ABN ) PH : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , -ABN ) PH2 : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-E , -E ) PK : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) PL : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-A , -A ) PR : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-E , -E ) PT : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-A , -A ) PY : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-E , -E ) QA : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) RO : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) RS : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-AER , -ER ) RU : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-AE , -AE ) SA : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) SE : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -SE ) SG : 20 20 20 20 20 20 20 20 20 20 20 20 20 20
(-E , -E ) SI : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) SK : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -ER ) TH : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) TN : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-EI , -E ) TR : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-A , -ANT ) TW : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-E , -E ) UA : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-A , -AB ) US : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , -AB ) US2 : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , -AB ) USL : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , - ) USX : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , -A ) UY : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-A , -AR ) VE : 27 27 27 27 27 27 27 27 27 27 27 27 . . .
(-E , -E ) VN : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
(-E , -E ) ZA : 20 20 20 20 20 20 20 20 20 20 20 20 20 .
    
```

# show wireless detail

To display the details of the wireless parameters configured, use the **show wireless detail** command in privileged EXEC mode.

**show wireless detail**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines** The following parameters are displayed:

- The wireless user idle timeout
- The controller configured RF group name
- Fast SSID change

**Examples** The following is sample output from the **show wireless detail** command:

```
Switch# show wireless detail
User Timeout      : 300
RF network        : default
Fast SSID         : Disabled
```

# show wireless dtls connections

To display the Datagram Transport Layer Security (DTLS) server status, use the **show wireless dtls connections** command in privileged EXEC mode.

**show wireless dtls connections**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show wireless dtls connections** command:

```
Switch# show wireless dtls connections
AP Name      Local Port  Peer IP     Peer Port  Ciphersuite
-----
AP-2         Capwap_Ctrl 10.0.0.16   52346     TLS_RSA_WITH_AES_128_CBC_SHA
AP-3         Capwap_Ctrl 10.0.0.17   52347     TLS_RSA_WITH_AES_128_CBC_SHA
```

# show wireless flow-control

To display the information about flow control on a particular channel, use the **show wireless flow-control** command in privileged EXEC mode.

**show wireless flow-control** *channel-id*

## Syntax Description

<i>channel-id</i>	Identification number for a channel through which flow control is monitored.
-------------------	--

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

## Examples

The following is sample output from the **show wireless flow-control** *channel-id* command:

```
Switch# show wireless flow-control 3
Channel Name           : CAPWAP
FC State               : Disabled
Remote Server State   : Enabled
Pass-thru Mode        : Disabled
EnQ Disabled          : Disabled
Queue Depth           : 2048
Max Retries            : 5
Min Retry Gap (mSec)  : 3
```

# show wireless flow-control statistics

To display the complete information about flow control on a particular channel, use the **show wireless flow-control statistics** command in privileged EXEC mode.

**show wireless flow-control** *channel-id* **statistics**

## Syntax Description

<i>channel-id</i>	Identification number for a channel through which flow control is monitored.
-------------------	--

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.3SE	This command was introduced.

## Examples

The following is sample output from the **show wireless flow-control** *channel-id* **statistics** command:

```
Switch# show wireless flow-control 3 statistics
Channel Name                : CAPWAP
# of times channel went into FC      : 0
# of times channel came out of FC    : 0
Total msg count received by the FC Infra : 1
Pass-thru msgs send count          : 0
Pass-thru msgs fail count          : 0
# of msgs successfully queued       : 0
# of msgs for which queuing failed  : 0
# of msgs sent thru after queuing   : 0
# of msgs sent w/o queuing         : 1
# of msgs for which send failed     : 0
# of invalid EAGAINS received      : 0
Highest watermark reached          : 0
# of times Q hit max capacity       : 0
Avg time channel stays in FC (mSec) : 0
```

# show wireless load-balancing

To display the status of the load-balancing feature, use the **show wireless load-balancing** command in privileged EXEC mode.

**show wireless load-balancing**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show wireless load-balancing** command:

```
> show wireless load-balancing
Aggressive Load Balancing.....: per WLAN enabling
Aggressive Load Balancing Window (clients).....: 5
Aggressive Load Balancing Denial Count.....: 3

Statistics
Total Denied Count (clients).....: 0
Total Denial Sent (messages).....: 0
Exceeded Denial Max Limit Count (times).....: 0
None 5G Candidate Count (times).....: 0
None 2.4G Candidate Count (times).....: 0
```



# show wireless performance

To display aggressive load balancing configuration, use the **show wireless performance** command in privileged EXEC mode.

**show wireless performance {ap| client} summary**

## Syntax Description

<b>ap summary</b>	Displays aggressive load balancing configuration of access points configured to the controller.
<b>client summary</b>	Displays aggressive load balancing configuration details of the clients.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show wireless performance ap summary** command.

```
Switch# show wireless performance ap summary
Number of APs:
```

The following is sample output from the **show wireless performance client summary** command.

```
Switch# show wireless performance client summary
Number of Clients:
```

```
MAC Address          AP Name              Status              WLAN/Guest-Lan Auth Protocol Port Wired
-----
```

# show wireless pmk-cache

To display information about the pairwise master key (PMK) cache, use the **show wireless pmk-cache** command in privileged EXEC mode.

```
show wireless pmk-cache[mac-address mac-addr]
```

## Syntax Description

---

**mac-address** *mac-addr* (Optional) Information about a single entry in the PMK cache.

---

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show wireless pmk-cache mac-address** command:

```
Switch# show wireless pmk-cache mac-address H.H.H
Number of PMK caches in total : 0
```

## show wireless probe

To display the advanced probe request filtering configuration and the number of probes sent to the WLAN controller per access point per client and the probe interval in milliseconds, use the **show wireless probe** command in privileged EXEC mode.

**show wireless probe**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** The following is sample output from the **show wireless probe** command:

```
Switch# show wireless probe
Probe request filtering           : Enabled
Number of probes per client per radio fwd from AP: 2
Probe request rate-limiting interval : 500 msec
Aggregate probe request interval   : 500 msec
```

# show wireless sip preferred-call-no

To display SIP preferred call numbers, use the **show wireless sip preferred-call-no** command in privileged EXEC mode.

**show wireless sip preferred-call-no**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show wireless sip preferred-call-no** command:

```
Switch# show wireless sip preferred-call-no
Index Preferred-Number
-----
1      1031
2      1032
4      1034
```

# show wireless summary

To display the number of access points, radios and wireless clients known to the controller, use the **show wireless summary** command in privileged EXEC mode.

**show wireless summary**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

The following is sample output from the **show wireless summary** command:

```
Switch# show wireless summary

Access Point Summary

              Total    Up    Down
-----
802.11a/n      2     2     0
802.11b/g/n    2     2     0
All APs        2     2     0

Client Summary

Current Clients : 1
Excluded Clients: 0
Disabled Clients: 0
```

# shutdown

To shut down VLAN switching, use the **shutdown** command in global configuration mode. To disable the configuration set, use the **no** form of this command.

**shutdown** [ **vlan** *vlan-id* ]

**no shutdown**

## Syntax Description

<b>vlan</b> <i>vlan-id</i>	VLAN ID of VLAN to shutdown.
----------------------------	------------------------------

## Command Default

No default behavior or values.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to shutdown a VLAN:

```
Switch(config)# vlan open1
Switch(config-wlan)# shutdown
```

This example shows that the access point is not shut down:

```
Switch# configure terminal
Switch(config)# ap name 3602a no shutdown
```

## system env temperature threshold yellow

To configure the difference between the yellow and red temperature thresholds that determines the value of yellow threshold, use the **system env temperature threshold yellow** command in global configuration mode. To return to the default value, use the **no** form of this command.

**system env temperature threshold yellow** *value*

**no system env temperature threshold yellow** *value*

### Syntax Description

*value* Specifies the difference between the yellow and red threshold values (in Celsius). The range is 10 to 25.

### Command Default

These are the default values

**Table 8: Default Values for the Temperature Thresholds**

Switch	Difference between Yellow and Red	Red <sup>1</sup>
Catalyst 3850	14°C	60°C

<sup>1</sup> You cannot configure the red temperature threshold.

### Command Modes

Global configuration

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Usage Guidelines

You cannot configure the green and red thresholds but can configure the yellow threshold. Use the **system env temperature threshold yellow** *value* global configuration command to specify the difference between the yellow and red thresholds and to configure the yellow threshold. For example, if the red threshold is 66 degrees C and you want to configure the yellow threshold as 51 degrees C, set the difference between the thresholds as 15 by using the **system env temperature threshold yellow 15** command. For example, if the red threshold is 60 degrees C and you want to configure the yellow threshold as 51 degrees C, set the difference between the thresholds as 9 by using the **system env temperature threshold yellow 9** command.

**Note**

---

The internal temperature sensor in the switch measures the internal system temperature and might vary  $\pm 5$  degrees C.

---

**Examples**

This example sets 15 as the difference between the yellow and red thresholds:

```
Switch(config)# system env temperature threshold yellow 15
Switch(config)#
```



# test cable-diagnostics tdr

To run the Time Domain Reflector (TDR) feature on an interface, use the **test cable-diagnostics tdr** command in privileged EXEC mode.

**test cable-diagnostics tdr interface** *interface-id*

<b>Syntax Description</b>	<i>interface-id</i>	The interface on which to run TDR.
---------------------------	---------------------	------------------------------------

**Command Default** No default behavior or values.

**Command Modes** Privileged EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines** TDR is supported only on 10/100/100 copper Ethernet ports. It is not supported on 10-Gigabit Ethernet ports or small form-factor pluggable (SFP) module ports.

After you run TDR by using the **test cable-diagnostics tdr interface** *interface-id* command, use the **show cable-diagnostics tdr interface** *interface-id* privileged EXEC command to display the results.

**Examples** This example shows how to run TDR on an interface:

```
Switch# test cable-diagnostics tdr interface gigabitethernet1/0/2
TDR test started on interface Gi1/0/2
A TDR test can take a few seconds to run on an interface
Use 'show cable-diagnostics tdr' to read the TDR results
```

If you enter the **test cable-diagnostics tdr interface** *interface-id* command on an interface that has an link up status and a speed of 10 or 100 Mb/s, these messages appear:

```
Switch# test cable-diagnostics tdr interface gigabitethernet1/0/3
TDR test on Gi1/0/9 will affect link state and traffic
TDR test started on interface Gi1/0/3
A TDR test can take a few seconds to run on an interface
Use 'show cable-diagnostics tdr' to read the TDR results.
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">show cable-diagnostics tdr</a>	Displays the TDR results.

## tracroute mac

To display the Layer 2 path taken by the packets from the specified source MAC address to the specified destination MAC address, use the **tracroute mac** command in privileged EXEC mode.

**tracroute mac** [**interface** *interface-id*] *source-mac-address* [**interface** *interface-id*] *destination-mac-address* [**vlan** *vlan-id*] [**detail**]

### Syntax Description

<b>interface</b> <i>interface-id</i>	(Optional) Specifies an interface on the source or destination switch.
<i>source-mac-address</i>	The MAC address of the source switch in hexadecimal format.
<i>destination-mac-address</i>	The MAC address of the destination switch in hexadecimal format.
<b>vlan</b> <i>vlan-id</i>	(Optional) Specifies the VLAN on which to trace the Layer 2 path that the packets take from the source switch to the destination switch. Valid VLAN IDs are 1 to 4094.
<b>detail</b>	(Optional) Specifies that detailed information appears.

### Command Default

No default behavior or values.

### Command Modes

Privileged EXEC

### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

### Usage Guidelines

For Layer 2 traceroute to function properly, Cisco Discovery Protocol (CDP) must be enabled on all of the switches in the network. Do not disable CDP.

When the switch detects a device in the Layer 2 path that does not support Layer 2 traceroute, the switch continues to send Layer 2 trace queries and lets them time out.

The maximum number of hops identified in the path is ten.

Layer 2 traceroute supports only unicast traffic. If you specify a multicast source or destination MAC address, the physical path is not identified, and an error message appears.

The **tracroute mac** command output shows the Layer 2 path when the specified source and destination addresses belong to the same VLAN.

If you specify source and destination addresses that belong to different VLANs, the Layer 2 path is not identified, and an error message appears.

If the source or destination MAC address belongs to multiple VLANs, you must specify the VLAN to which both the source and destination MAC addresses belong.

If the VLAN is not specified, the path is not identified, and an error message appears.

The Layer 2 traceroute feature is not supported when multiple devices are attached to one port through hubs (for example, multiple CDP neighbors are detected on a port).

When more than one CDP neighbor is detected on a port, the Layer 2 path is not identified, and an error message appears.

This feature is not supported in Token Ring VLANs.

## Examples

This example shows how to display the Layer 2 path by specifying the source and destination MAC addresses:

```
Switch# traceroute mac 0000.0201.0601 0000.0201.0201
Source 0000.0201.0601 found on con6[WS-C3750E-24PD] (2.2.6.6)
con6 (2.2.6.6) :Gi0/0/1 => Gi0/0/3
con5          (2.2.5.5       ) :   Gi0/0/3 => Gi0/0/1
con1          (2.2.1.1       ) :   Gi0/0/1 => Gi0/0/2
con2          (2.2.2.2       ) :   Gi0/0/2 => Gi0/0/1
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed
```

This example shows how to display the Layer 2 path by using the **detail** keyword:

```
Switch# traceroute mac 0000.0201.0601 0000.0201.0201 detail
Source 0000.0201.0601 found on con6[WS-C3750E-24PD] (2.2.6.6)
con6 / WS-C3750E-24PD / 2.2.6.6 :
    Gi0/0/2 [auto, auto] => Gi0/0/3 [auto, auto]
con5 / WS-C2950G-24-EI / 2.2.5.5 :
    Fa0/3 [auto, auto] => Gi0/1 [auto, auto]
con1 / WS-C3550-12G / 2.2.1.1 :
    Gi0/1 [auto, auto] => Gi0/2 [auto, auto]
con2 / WS-C3550-24 / 2.2.2.2 :
    Gi0/2 [auto, auto] => Fa0/1 [auto, auto]
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed.
```

This example shows how to display the Layer 2 path by specifying the interfaces on the source and destination switches:

```
Switch# traceroute mac interface fastethernet0/1 0000.0201.0601 interface fastethernet0/3
0000.0201.0201
Source 0000.0201.0601 found on con6[WS-C3750E-24PD] (2.2.6.6)
con6 (2.2.6.6) :Gi0/0/1 => Gi0/0/3
con5          (2.2.5.5       ) :   Gi0/0/3 => Gi0/0/1
con1          (2.2.1.1       ) :   Gi0/0/1 => Gi0/0/2
con2          (2.2.2.2       ) :   Gi0/0/2 => Gi0/0/1
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed
```

This example shows the Layer 2 path when the switch is not connected to the source switch:

```
Switch# traceroute mac 0000.0201.0501 0000.0201.0201 detail
Source not directly connected, tracing source .....
Source 0000.0201.0501 found on con5[WS-C3750E-24TD] (2.2.5.5)
con5 / WS-C3750E-24TD / 2.2.5.5 :
    Gi0/0/1 [auto, auto] => Gi0/0/3 [auto, auto]
con1 / WS-C3550-12G / 2.2.1.1 :
    Gi0/1 [auto, auto] => Gi0/2 [auto, auto]
con2 / WS-C3550-24 / 2.2.2.2 :
```

```

      Gi0/2 [auto, auto] => Fa0/1 [auto, auto]
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed.

```

This example shows the Layer 2 path when the switch cannot find the destination port for the source MAC address:

```

Switch# tracert mac 0000.0011.1111 0000.0201.0201
Error:Source Mac address not found.
Layer2 trace aborted.

```

This example shows the Layer 2 path when the source and destination devices are in different VLANs:

```

Switch# tracert mac 0000.0201.0601 0000.0301.0201
Error:Source and destination macs are on different vlans.
Layer2 trace aborted.

```

This example shows the Layer 2 path when the destination MAC address is a multicast address:

```

Switch# tracert mac 0000.0201.0601 0100.0201.0201
Invalid destination mac address

```

This example shows the Layer 2 path when source and destination switches belong to multiple VLANs:

```

Switch# tracert mac 0000.0201.0601 0000.0201.0201
Error:Mac found on multiple vlans.
Layer2 trace aborted.

```

## Related Commands

Command	Description
<a href="#">tracert mac ip</a>	Displays the Layer 2 path taken by the packets from the specified source IP address or hostname to the specified destination IP address or hostname.

# traceroute mac ip

To display the Layer 2 path taken by the packets from the specified source IP address or hostname to the specified destination IP address or hostname, use the **traceroute mac ip** command in privileged EXEC mode.

**traceroute mac ip** {*source-ip-address* | *source-hostname*} {*destination-ip-address* | *destination-hostname*} [**detail**]

## Syntax Description

<i>source-ip-address</i>	The IP address of the source switch as a 32-bit quantity in dotted-decimal format.
<i>source-hostname</i>	The IP hostname of the source switch.
<i>destination-ip-address</i>	The IP address of the destination switch as a 32-bit quantity in dotted-decimal format.
<i>destination-hostname</i>	The IP hostname of the destination switch.
<b>detail</b>	(Optional) Specifies that detailed information appears.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

For Layer 2 traceroute to function properly, Cisco Discovery Protocol (CDP) must be enabled on each switch in the network. Do not disable CDP.

When the switch detects a device in the Layer 2 path that does not support Layer 2 traceroute, the switch continues to send Layer 2 trace queries and lets them time out.

The maximum number of hops identified in the path is ten.

The **traceroute mac ip** command output shows the Layer 2 path when the specified source and destination IP addresses are in the same subnet.

When you specify the IP addresses, the switch uses Address Resolution Protocol (ARP) to associate the IP addresses with the corresponding MAC addresses and the VLAN IDs.

- If an ARP entry exists for the specified IP address, the switch uses the associated MAC address and identifies the physical path.

- If an ARP entry does not exist, the switch sends an ARP query and tries to resolve the IP address. The IP addresses must be in the same subnet. If the IP address is not resolved, the path is not identified, and an error message appears.

The Layer 2 traceroute feature is not supported when multiple devices are attached to one port through hubs (for example, multiple CDP neighbors are detected on a port).

When more than one CDP neighbor is detected on a port, the Layer 2 path is not identified, and an error message appears.

This feature is not supported in Token Ring VLANs.

## Examples

This example shows how to display the Layer 2 path by specifying the source and destination IP addresses and by using the **detail** keyword:

```
Switch# traceroute mac ip 2.2.66.66 2.2.22.22 detail
Translating IP to mac .....
2.2.66.66 => 0000.0201.0601
2.2.22.22 => 0000.0201.0201

Source 0000.0201.0601 found on con6[WS-C2950G-24-EI] (2.2.6.6)
con6 / WS-C3750E-24TD / 2.2.6.6 :
      Gi0/0/1 [auto, auto] => Gi0/0/3 [auto, auto]
con5 / WS-C2950G-24-EI / 2.2.5.5 :
      Fa0/3 [auto, auto] => Gi0/1 [auto, auto]
con1 / WS-C3550-12G / 2.2.1.1 :
      Gi0/1 [auto, auto] => Gi0/2 [auto, auto]
con2 / WS-C3550-24 / 2.2.2.2 :
      Gi0/2 [auto, auto] => Fa0/1 [auto, auto]
Destination 0000.0201.0201 found on con2[WS-C3550-24] (2.2.2.2)
Layer 2 trace completed.
```

This example shows how to display the Layer 2 path by specifying the source and destination hostnames:

```
Switch# traceroute mac ip con6 con2
Translating IP to mac .....
2.2.66.66 => 0000.0201.0601
2.2.22.22 => 0000.0201.0201

Source 0000.0201.0601 found on con6
con6 (2.2.6.6) :Gi0/0/1 => Gi0/0/3
con5          (2.2.5.5      ) :   Gi0/0/3 => Gi0/1
con1          (2.2.1.1      ) :   Gi0/0/1 => Gi0/2
con2          (2.2.2.2      ) :   Gi0/0/2 => Fa0/1
Destination 0000.0201.0201 found on con2
Layer 2 trace completed
```

This example shows the Layer 2 path when ARP cannot associate the source IP address with the corresponding MAC address:

```
Switch# traceroute mac ip 2.2.66.66 2.2.77.77
Arp failed for destination 2.2.77.77.
Layer2 trace aborted.
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">traceroute mac</a>	Displays the Layer 2 path taken by the packets from the specified source MAC address to the specified destination MAC address.

# trapflags

To enable sending rogue access point detection traps, use the **trapflags** command in privileged EXEC mode. To disable sending rogue access point detection traps, use the **no** form of this command.

**trapflags rogueap**

**no trapflags rogueap**

## Syntax Description

<b>rogueap</b>	Enables sending rogue access point detection traps.
----------------	---

## Command Default

Enabled.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to disable the sending of rogue access point detection traps:

```
Switch# configure terminal
Switch(config)# no trapflags rogueap
Switch(config)# end
```



# trapflags client

To enable the sending of client-related DOT11 traps, use the **trapflags client** command in privileged EXEC mode. To disable the sending of client-related DOT11 traps, use the **no** form of this command.

**trapflags client** [**dot11** {**assocfail** | **associate** | **authfail** | **deauthenticate** | **disassociate**} | **excluded**]

**no trapflags client** [**dot11** {**assocfail** | **associate** | **authfail** | **deauthenticate** | **disassociate**} | **excluded**]

## Syntax Description

<b>dot11</b>	Client-related DOT11 traps.
<b>assocfail</b>	Enables the sending of Dot11 association fail traps to clients.
<b>associate</b>	Enables the sending of Dot11 association traps to clients.
<b>authfail</b>	Enables the sending of Dot11 authentication fail traps to clients.
<b>deauthenticate</b>	Enables the sending of Dot11 deauthentication traps to clients.
<b>disassociate</b>	Enables the sending of Dot11 disassociation traps to clients.
<b>excluded</b>	Enables the sending of excluded trap to clients.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to enable the sending of Dot11 disassociation trap to clients:

```
Switch# configure terminal
Switch(config)# trapflags client dot11 disassociate
Switch(config)# end
```

# type

To display the contents of one or more files, use the **type** command in boot loader mode.

**type** *filesystem:/file-url...*

## Syntax Description

<i>filesystem:</i>	Alias for a file system. Use <b>flash:</b> for the system board flash device; use <b>usbflash0:</b> for USB memory sticks.
<i>/file-url...</i>	Path (directory) and name of the files to display. Separate each filename with a space.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Filenames and directory names are case sensitive.

If you specify a list of files, the contents of each file appear sequentially.

## Examples

This example shows how to display the contents of a file:

```
Switch: type flash:image_file_name
version_suffix: universal-122-xx.SEx
version_directory: image_file_name
image_system_type_id: 0x00000002
image_name: image_file_name.bin
ios_image_file_size: 8919552
total_image_file_size: 11592192
image_feature: IP|LAYER_3|PLUS|MIN_DRAM_MEG=128
image_family: family
stacking_number: 1.34
board_ids: 0x00000068 0x00000069 0x0000006a 0x0000006b
info_end:
```

# unset

To reset one or more environment variables, use the **unset** command in boot loader mode.

**unset** *variable*...

## Syntax Description

<i>variable</i>	Use one of these keywords for <i>variable</i> : <b>MANUAL_BOOT</b> —Specifies whether the switch automatically or manually boots.
	<b>BOOT</b> —Resets the list of executable files to try to load and execute when automatically booting. If the BOOT environment variable is not set, the system attempts to load and execute the first executable image it can find by using a recursive, depth-first search through the flash: file system. If the BOOT variable is set but the specified images cannot be loaded, the system attempts to boot the first bootable file that it can find in the flash: file system.
	<b>ENABLE_BREAK</b> —Specifies whether the automatic boot process can be interrupted by using the <b>Break</b> key on the console after the flash: file system has been initialized.
	<b>HELPER</b> —Identifies the semicolon-separated list of loadable files to dynamically load during the boot loader initialization. Helper files extend or patch the functionality of the boot loader.
	<b>PS1</b> —Specifies the string that is used as the command-line prompt in boot loader mode.
	<b>CONFIG_FILE</b> —Resets the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration.
	<b>BAUD</b> —Resets the rate in bits per second (b/s) used for the console. The Cisco IOS software inherits the baud rate setting from the boot loader and continues to use this value unless the configuration file specifies another setting.

## Command Default

No default behavior or values.

## Command Modes

Boot loader

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Under typical circumstances, it is not necessary to alter the setting of the environment variables.

The MANUAL\_BOOT environment variable can also be reset by using the **no boot manual** global configuration command.

The BOOT environment variable can also be reset by using the **no boot system** global configuration command.

The ENABLE\_BREAK environment variable can also be reset by using the **no boot enable-break** global configuration command.

The HELPER environment variable can also be reset by using the **no boot helper** global configuration command.

The CONFIG\_FILE environment variable can also be reset by using the **no boot config-file** global configuration command.

### Examples

This example shows how to unset the SWITCH\_PRIORITY environment variable:

```
Switch: unset SWITCH_PRIORITY
```

### Related Commands

Command	Description
<a href="#">set</a>	Sets or displays environment variables.
<a href="#">reset</a>	Performs a hard reset on the system.

# version

To display the boot loader version, use the **version** command in boot loader mode.

**version**

**Syntax Description** This command has no arguments or keywords.

**Command Default** No default behavior or values.

**Command Modes** Boot loader

Command History	Release	Modification
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** This example shows how to display the boot loader version on a switch:

```
Switch: version
CAT3K_CAA Boot Loader (CAT3K_CAA-HBOOT-M) Version 1.3, RELEASE SOFTWARE (P)
Compiled Sun Jun 16 18:31:15 PDT 2013 by rel
```

## wireless client

To configure client parameters, use the **wireless client** command in global configuration mode.

**wireless client** {**association limit** *assoc-number* **interval** *interval*} **band-select** {**client-rssi** *rss*| **cycle-count** *count*| **cycle-threshold** *threshold*| **expire dual-band** *timeout*| **expire suppression** *timeout*}| **max-user-login** *max-user-login*| **timers** **auth-timeout** *seconds*| **user-timeout** *user-timeout*}

### Syntax Description

<b>association limit</b> <i>assoc-number</i> <b>interval</b> <i>interval</i>	Enables association request limit per access point slot at a given interval and configures the association request limit interval.  You can configure number of association request per access point slot at a given interval from one through 100.  You can configure client association request limit interval from 100 through 10000 milliseconds.
<b>band-select</b>	Configures band select options for the client.
<b>client-rssi</b> <i>rss</i>	Sets the client received signal strength indicator (RSSI) threshold for band select.  Minimum dBm of a client RSSI to respond to probe between -90 and -20.
<b>cycle-count</b> <i>count</i>	Sets the band select probe cycle count.  You can configure the cycle count from one through 10.
<b>cycle-threshold</b> <i>threshold</i>	Sets the time threshold for a new scanning cycle.  You can configure the cycle threshold from one through 1000 milliseconds.
<b>expire dual-band</b> <i>timeout</i>	Sets the timeout before stopping to try to push a given client to the 5-GHz band.  You can configure the timeout from 10 through 300 seconds, and the default value is 60 seconds.
<b>expire suppression</b> <i>timeout</i>	Sets the expiration time for pruning previously known dual-band clients.  You can configure the suppression from 10 through 200 seconds, and the default timeout value is 20 seconds.
<b>max-user-login</b> <i>max-user-login</i>	Configures the maximum number of login sessions for a user.
<b>timers</b> <b>auth-timeout</b> <i>seconds</i>	Configures client timers.
<b>user-timeout</b> <i>user-timeout</i>	Configures the idle client timeout.

**Command Default** No default behavior or values.

**Command Modes** Global configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

**Examples** This example shows how to set the probe cycle count for band select to 8:

```
Switch# configure terminal
Switch(config)# wireless client band-select cycle-count 8
Switch(config)# end
```

This example shows how to set the time threshold for a new scanning cycle with threshold value of 700 milliseconds:

```
Switch# configure terminal
Switch(config)# wireless client band-select cycle-threshold 700
Switch(config)# end
```

This example shows how to suppress dual-band clients from the dual-band database after 70 seconds:

```
Switch# configure terminal
Switch(config)# wireless client band-select expire suppression 70
Switch(config)# end
```

# wireless client mac-address deauthenticate

To disconnect a wireless client, use the **wireless client mac-address deauthenticate** command in global configuration mode.

**wirelessclientmac-address** *mac-addr*deauthenticate

<b>Syntax Description</b>	<b>mac-address</b> <i>mac-addr</i>	Wireless client MAC address.
<b>Command Default</b>	No default behavior or values.	
<b>Command Modes</b>	Global configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Cisco IOS XE 3.2SE	This command was introduced.

## Examples

This example shows how to disconnect a wireless client:

```
Switch# configure terminal
Switch(config)# wireless client mac-address 00:1f:ca:cf:b6:60 deauthenticate
Switch(config)# end
```



## wireless client mac-address

To configure the wireless client settings, use the **wireless client mac-address** command in global configuration mode.

```
wireless client mac-address mac-addr ccx {clear-reports| clear-results| default-gw-ping| dhcp-test|
dns-ping| dns-resolve hostname host-name| get-client-capability| get-manufacturer-info|
get-operating-parameters| get-profiles| log-request {roam| rsna| syslog}| send-message message-id|
stats-request measurement-duration {dot11| security}| test-abort| test-association ssid bssid dot11 channel|
test-dot1x [ profile-id ] bssid dot11 channel| test-profile {any| profile-id}
```

### Syntax Description

<i>mac-addr</i>	MAC address of the client.
<b>ccx</b>	Cisco client extension (CCX).
<b>clear-reports</b>	Clears the client reporting information.
<b>clear-results</b>	Clears the test results on the controller.
<b>default-gw-ping</b>	Sends a request to the client to perform the default gateway ping test.
<b>dhcp-test</b>	Sends a request to the client to perform the DHCP test.
<b>dns-ping</b>	Sends a request to the client to perform the Domain Name System (DNS) server IP address ping test.
<b>dns-resolve hostname</b> <i>host-name</i>	Sends a request to the client to perform the Domain Name System (DNS) resolution test to the specified hostname.
<b>get-client-capability</b>	Sends a request to the client to send its capability information.
<b>get-manufacturer-info</b>	Sends a request to the client to send the manufacturer's information.
<b>get-operating-parameters</b>	Sends a request to the client to send its current operating parameters.
<b>get-profiles</b>	Sends a request to the client to send its profiles.
<b>log-request</b>	Configures a CCX log request for a specified client device.
<b>roam</b>	(Optional) Specifies the request to specify the client CCX roaming log
<b>rsna</b>	(Optional) Specifies the request to specify the client CCX RSNA log.
<b>syslog</b>	(Optional) Specifies the request to specify the client CCX system log.

wireless client mac-address

---

**send-message** *message-id*

Sends a message to the client.

Message type that involves one of the following:

- 1—The SSID is invalid
- 2—The network settings are invalid.
- 3—There is a WLAN credibility mismatch.
- 4—The user credentials are incorrect.
- 5—Please call support.
- 6—The problem is resolved.
- 7—The problem has not been resolved.
- 8—Please try again later.
- 9—Please correct the indicated problem.
- 10—Troubleshooting is refused by the network.
- 11—Retrieving client reports.
- 12—Retrieving client logs.
- 13—Retrieval complete.
- 14—Beginning association test.
- 15—Beginning DHCP test.
- 16—Beginning network connectivity test.
- 17—Beginning DNS ping test.
- 18—Beginning name resolution test.
- 19—Beginning 802.1X authentication test.
- 20—Redirecting client to a specific profile.
- 21—Test complete.
- 22—Test passed.
- 23—Test failed.
- 24—Cancel diagnostic channel operation or select a WLAN profile to resume normal operation.
- 25—Log retrieval refused by the client.
- 26—Client report retrieval refused by the client.
- 27—Test request refused by the client.
- 28—Invalid network (IP) setting.
- 29—There is a known outage or problem with the network.
- 30—Scheduled maintenance period.

- 31—The WLAN security method is not correct.
- 32—The WLAN encryption method is not correct.
- 33—The WLAN authentication method is not correct.

<b>stats-request</b> <i>measurement-duration</i>	Sends a request for statistics.
<b>dot11</b>	(Optional) Specifies dot11 counters.
<b>security</b>	(Optional) Specifies security counters.
<b>test-abort</b>	Sends a request to the client to abort the current test.
<b>test-association</b> <i>ssid bssid</i> <i>dot11 channel</i>	Sends a request to the client to perform the association test.
<b>test-dot1x</b>	Sends a request to the client to perform the 802.1x test.
<i>profile-id</i>	(Optional) Test profile name.
<i>bssid</i>	Basic SSID.
<i>dot11</i>	Specifies the 802.11a, 802.11b, or 802.11g network.
<i>channel</i>	Channel number.
<b>test-profile</b>	Sends a request to the client to perform the profile redirect test.
<b>any</b>	Sends a request to the client to perform the profile redirect test.
<i>profile-id</i>	Test profile name. <b>Note</b> The profile ID should be from one of the client profiles for which client reporting is enabled.

**Command Default** No default behavior or values.

**Command Modes** Global configuration

#### Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

**Usage Guidelines** The **default-gw-ping** test does not require the client to use the diagnostic channel.

**Examples**

This example shows how to clear the reporting information of the client MAC address 00:1f:ca:cf:b6:60:

```
Switch# configure terminal  
Switch(config)# wireless client mac-address 00:1f:ca:cf:b6:60 ccx clear-reports  
Switch(config)# end
```

# wireless load-balancing

To globally configure aggressive load balancing on the controller, use the **wireless load-balancing** command in global configuration mode.

**wireless load-balancing** {**denial** *denial-count*| **window** *client-count*}

## Syntax Description

<b>denial</b> <i>denial-count</i>	Specifies the number of association denials during load balancing.  Maximum number of association denials during load balancing is from 1 to 10 and the default value is 3.
<b>window</b> <i>client-count</i>	Specifies the aggressive load balancing client window, with the number of clients needed to trigger aggressive load balancing on a given access point.  Aggressive load balancing client window with the number of clients is from 0 to 20 and the default value is 5.

## Command Default

Disabled.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Load-balancing-enabled WLANs do not support time-sensitive applications like voice and video because of roaming delays.

When you use Cisco 7921 and 7920 Wireless IP Phones with controllers, make sure that aggressive load balancing is disabled on the voice WLANs for each controller. Otherwise, the initial roam attempt by the phone might fail, causing a disruption in the audio path.

## Examples

This example shows how to configure association denials during load balancing:

```
Switch# configure terminal
Switch(config)# wireless load-balancing denial 5
Switch(config)# end
```

# wireless sip preferred-call-no

To add a new preferred call or configure voice prioritization, use the **wireless sip preferred-call-no** command in global configuration mode. To remove a preferred call, use the **no** form of this command.

**wireless sip preferred-call-no** *callIndex* *call-no*

**no wireless sip preferred-call-no** *callIndex*

## Syntax Description

<i>callIndex</i>	Call index with valid values between 1 and 6.
<i>call-no</i>	Preferred call number that can contain up to 27 characters.

## Command Default

No default behavior or values.

## Command Modes

Global configuration

## Command History

Release	Modification
Cisco IOS XE 3.2SE	This command was introduced.

## Usage Guidelines

Before you configure voice prioritization, you must complete the following prerequisites:

- Set WLAN QoS to allow voice calls to pass through.
- Enable ACM for the radio.
- Enable SIP call snooping on the WLAN.

## Examples

This example shows how to add a new preferred call or configure voice prioritization:

```
Switch# configure terminal
Switch(config)# wireless sip preferred-call-no 2 0123456789
Switch(config)# end
```

wireless sip preferred-call-no





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